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ABSTRACT

This manual is designed to help Florida teachers incorporate assessment and instruction of phonological awareness into their pre-reading and reading curriculum. The first section describes what phonological awareness is and how it is related to reading instruction. It summarizes research evidence on the role of phonological awareness in reading growth and the relationship between poor phonological awareness and reading disability. The second section presents information about the assessment of phonological awareness. It describes how phonological awareness is assessed through sound comparison, phoneme segmentation, and phoneme blending, and factors that should be considered in selecting an assessment. Six assessments are then profiled with information on the tests' reliability, validity, and scoring. The following section describes how instruction in phonological awareness can be integrated into reading instruction. It recommends that instruction in phonological awareness begin with easier tasks and move toward difficult tasks, that it should be a regular part of the curriculum, and that instruction should involve both analytic and synthetic activities. Pronunciation suggestions for individual phonemes are also provided. The last section presents descriptive information about a range of computer software programs for home and school use in building pre-reading skills in young children. (Contains 31 references.) (CR)

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Assessment and Instruction in

Phonological Awareness

By

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Preface

The discovery of the importance of phonemic awareness in early reading is generally thought to be one of the most important breakthroughs in reading instruction in the last 20 years. This manual is written to help teachers incorporate assessment and instruction of phonological awareness into their pre-reading and reading curriculum.

The first question every busy teacher has a right to ask about this manual is, "Will this help me do my job more effectively?" The answer in this case is relatively straightforward. If you take the time to study the concepts and materials discussed in this manual, you will learn how to help more children learn to read well.

There is now a very strong research base indicating that at least 20 percent of school children will experience special difficulties learning to read without explicit instruction to stimulate phonological awareness. Such instruction also appears to accelerate reading development in all children It is essential that all kindergarten, first, and second grade teachers, as well as all teachers who work with children with reading disabilities, understand what phonological awareness is, how it can be quickly assessed, and how we can help children acquire it.

This manual is divided into four main sections. The first section describes what phonological awareness is and how it is related to reading instruction.

The second section presents information about the assessment of phonological awareness, and the third section describes how instruction in phonological awareness can be integrated into reading instruction. These sections present detailed information on and evaluations of presently available tests and curriculum materials in this area.

—continued

The fourth section presents descriptive information about a range of computer software marketed for home and school use in building pre-reading skills in young children.

We hope teachers will find this manual useful in their efforts to help all children acquire effective literacy skills. We are convinced that information about phonological awareness can make a difference if it is understood and applied properly. Best wishes in your work with Florida's children.

Note: The descriptions of tests, curriculum materials, and software provided herein include the name and contact information for a company from which the product may be purchased. However, in many cases other companies also sell the product. Therefore, the price listed for each item may not be the lowest price for which the product can be obtained. Schools are advised to use the internet and other resources to determine the best source of any product.

Phonological Awareness and Its Importance in Reading

Section 1

Some of the information in this section overlaps with that found in the pamphlet "What Every Teacher Should Know about Phonological Awareness," which you may have already read. If you have read the pamphlet, you may want to skip directly to the part of this section dealing with additional research evidence.

One other note before we begin: When speech researchers write about the sounds in words, they use a phonetic alphabet that has a unique symbol for each of the 44 phonemes in our language. Since most teachers are unfamiliar with this alphabet, we will represent the sounds in words by using a letter enclosed by slash marks. For example, the sounds in the word *bat* will be represented like this: /b/-/a/-/t/. Whenever you see a letter enclosed by slash marks in this manual, you should think of the sound of the letter, rather than its name.

What Is Phonological Awareness?

In order to understand the concept of phonological awareness, we must first know what a phoneme is. A phoneme is the smallest unit of sound in our language that makes a difference in a word's meaning. For example, the word *cat* has three phonemes, /k/- /a/- /t/. By changing the first phoneme, we can produce the word *bat*. Changing the second phoneme creates the word *cot*, and we can obtain the word *cab* by altering the final phoneme. Words in English (in fact, in all languages) are composed of strings of phonemes. This is fortunate, because it allows us to create all the words we will ever need by using various combinations of just 44 different speech sounds!

Speech researchers have discovered that the human brain is specifically adapted for processing many different kinds of linguistic information, and one part of our biologi-

cal endowment allows us to process the complex phonological information in speech without actually being aware of the individual phonemes themselves. This is one of the human abilities that makes acquiring speech a natural process, so that almost everyone in the world learns to speak a language with very little direct instruction. However, because phonemes are represented by letters in print, learning to read requires that children become consciously aware of phonemes as individual segments in words. In fact, **phonological awareness is most commonly defined as one's sensitivity to, or explicit awareness of, the phonological structure of words in one's language. In short, it involves the ability to notice, think about, or manipulate the individual sounds in words.**

One of the early signs of emerging sensitivity to the phonological structure of words is the ability to play rhyming games and activities In order to tell whether two words rhyme, the child must attend to the **sounds** in words rather than their meaning. In addition, the child must focus attention on only **one part** of a word rather than the way it sounds as a whole. As children grow in awareness of the phonemes in words, they become able to judge whether words have the same first or last sounds, and with further development, they become able to actually isolate and pronounce the first, last, or middle sounds in words. At its highest levels of development, awareness of individual phonemes in words is shown by the ability to separately pronounce the sounds in even multisyllable words, or to tell exactly how two words like task and tacks are different (the order of the last two phonemes is reversed).

Acquiring phonological awareness actually involves learning two kinds of things about language. First, it involves learning that words can be divided into segments of sound smaller than a syllable. Second, it involves learning about individual phonemes themselves. As children acquire more and more conscious knowledge of the distinctive features of phonemes (how they sound when they occur in words, or how they feel when they are pronounced) they become more adept at noticing their identity and order when they occur in words. For example, while children in the first semester of first grade might be able to isolate and identify the first or last sound of a word like *man*, by the end of first grade, most children can easily, and relatively automatically, segment all the sounds in a more complex word like *clap*. Children must acquire knowledge of the distinctive features of phonemes so they can recognize them when they occur with slightly varied pronunciations in different words. For instance, the sound /l/ varies slightly in its pronunciation depending upon whether it occurs at the beginning of a spoken word such as *last*, as the second sound in a consonant blend as in *flat*, in the middle of a word, such as *shelving*, or in a final blend such as in *fault*. Children will be able to understand the way the letters represent sounds in these words better if they recognize that the same phoneme, /l/, is represented by the letter *l* in each of these words.

Why Is Phonological Awareness Important in Learning to Read?

Phonological awareness is important because it strongly supports learning how the words in our language are represented in print. When children learn to read, they must acquire two different kinds of skills. They must learn how to identify printed words, and they must learn how to comprehend written material. Their major challenge when they first enter school is to learn to accurately identify printed words, and this brings them face to face with the alphabetic principle. English is an alphabetic language, meaning that words are

represented in print roughly at the level of phonemes. For example, the word *cat* has three phonemes, and three letters are used to represent them; the word *which* also has three phonemes, but five letters are used to represent them.

In our language, the alphabetic principle presents two important learning challenges to children. First, individual phonemes are not readily apparent as individual segments in normal speech. When we say the word *dog*, for example, the phonemes overlap with one another (they are coarticulated), so that we hear a single burst of sound rather than three individual segments. Coarticulating the phonemes in words (e.g., starting to pronounce the second phoneme, /r/, in the word *frost* while we are still saying the first phoneme, /f/) makes speech fluent, but it also makes it hard for many children to become aware of phonemes as individual segments of sound within words.

The second challenge presented by the alphabetic principle in our language is that there is not always a regular one-to-one correspondence between letters and phonemes. For example, some phonemes are represented by more than one letter (e.g., ch, sh, wh, ai, oi). In addition, sometimes the phoneme represented by a letter changes, depending on other letters in the word (*not* vs. *note*, *fit* vs. *fight*, *not* vs. *notion*), or pronunciation of parts of some words may not follow any regular letter-phoneme correspondence patterns, such as in *yacht* or *choir*

If understanding and utilizing the alphabetic principle in reading words presents such learning challenges for children, the obvious question, and one that has been repeatedly asked over the last century, is whether it is really necessary for children to understand the principle and master its use in order to become good readers. On the basis of research on reading, reading development, and reading instruction conducted over the past twenty years, we now know that the answer to this question is very strongly in the affirmative! Children who quickly come to understand the relationships between letters and phonemes, and who learn to utilize this information as an aide to identifying words in print, almost invariably become better readers than children who have difficulty acquiring these skills (Adams, 1990; Beck & Juel, 1995).

There are at least three ways that phonological awareness is important in learning beginning word reading skills.

- **It helps children understand the alphabetic principle.** Without at least a beginning level of phonological awareness, children have no way of understanding how the words from their oral language are represented in print. Unless they understand that words have sound segments at the level of the phoneme, they cannot take advantage of an alphabetic script. They will also not be able to understand the rationale for learning individual letter sounds, and the common strategy of "sounding out" words in beginning reading will not make sense to them.

- **It helps children notice the regular ways that letters represent sounds in words.** If children can notice all four phonemes in the spoken word *flat*, it helps them understand the way the letters in the written word correspond to the sounds. This ability to notice the match between the letters and sounds in words has two potential benefits to children learning to read. First, it reinforces knowledge of individual letter-sound correspondences, and second, it helps in forming mental representations of words so they can be accurately recognized when they are encountered in print again. Research has shown that the associations children form between the letters and

sounds in words help create the kind of sight-word representations that are the basis of fluent reading (Ehri, in press).

- **It makes it possible to generate possibilities for words in context that are only partially sounded out.** For example, consider a first-grade child who encounters a sentence such as "John's father put John's bicycle in the car," and cannot recognize the fifth word. A relatively early level of phonological awareness supports the ability to search one's mental dictionary for words that begin with similar sounds. Thus, if the child knows the sound represented by the letter b, he/she can mentally search for words that begin with that sound and fit the context. As children acquire more knowledge of phonics and can sound out more letters in words, their search for words with similar phonemes in them can proceed much more quickly and accurately.

As should be clear from this analysis, phonemic awareness has its primary impact on reading growth through its effect on children's ability to phonetically decode words in text. Although phonetic decoding skills should never be considered the end goal of reading, research now shows that, for most children, acquiring these skills during early elementary school is a critical step along the way toward becoming an effective reader

Research Evidence for the Role of Phonological Awareness in Reading Growth

There are three major kinds of evidence that directly demonstrate the important role that phonological awareness plays in helping children during the early stages of learning to read. One type of evidence is provided by studies showing that the level of phonological awareness in kindergarten is a very strong predictor of children's progress in learning to read. Another type of evidence comes from studies indicating that deficient phonological awareness is one of the most reliable diagnostic signs of serious reading disabilities. The final type of evidence comes from research that has demonstrated the positive effects on reading growth of instruction designed to stimulate phonological awareness.

Differences in Phonological Awareness Predict Subsequent Growth in Reading Ability

Many studies have examined the extent to which differences in phonological awareness among children in kindergarten and beginning first grade can predict who will become good and poor readers after reading instruction begins. For example, one early study showed that several short phonological awareness tasks administered during the second semester of kindergarten each predicted first-grade word reading skill as well as or better than the six subsections of a standard readiness test or a standardized intelligence test (Stanovich, Cunningham, & Cramer, 1984).

One of the most complete investigations of the relationship between early differences in phonological awareness and subsequent reading growth has been conducted at Florida State University (Torgesen, Wagner, & Rashotte, 1994; Wagner, et al., 1997). In this study, we followed the reading growth of approximately 200 children from kindergarten through the end of fifth grade. The graph on the next page presents information on the growth of word reading ability in two groups of children who began first grade with quite different levels of phonological awareness. The numbers at the right of the graphs represent average grade-level score at the end of fifth grade of children who scored above and below the 20th percentile on phonological awareness

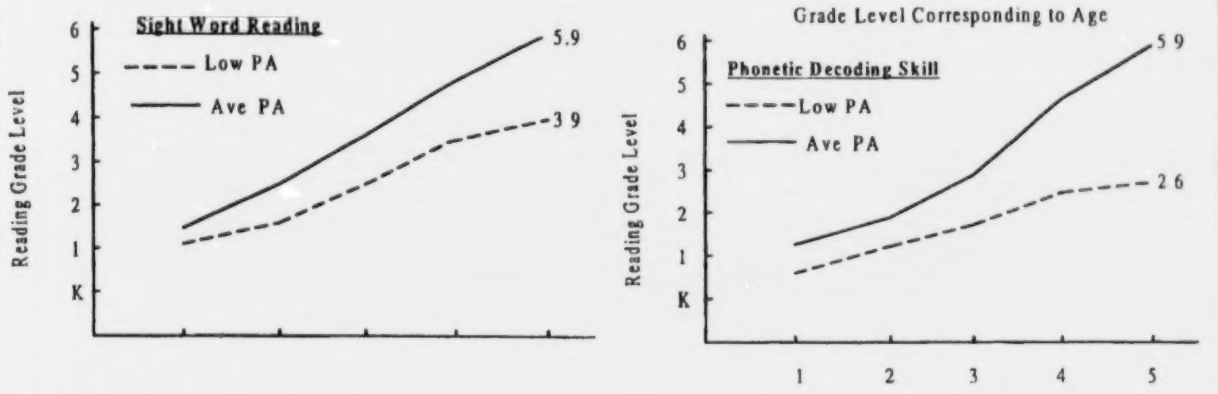

Figure 1. Growth of sight-word and phonetic decoding skill in children who begin first grade below the 20th percentile in phonological awareness

tests at the beginning of first grade. In other words, the graphs compare the group of children who fell in the bottom 20th percentile on measures of phonological awareness with the group of children who scored above the 20th percentile. All the children had general verbal ability in the normal range.

From the left panel, we can see that children with weak phonological awareness ended up about two grade levels below their peers in sight-word reading ability, and the right panel shows that their phonetic reading skills were more than three grade levels below their peers. On a measure of reading comprehension, the children with weak phonological awareness obtained a grade score of 3.9, which was three years behind the score of 6.9 obtained by their peers.

It is interesting to note that phonological awareness is a strong predictor of reading growth not only in English, but also in Swedish, Spanish, French, Italian, Portuguese, and Russian.

Poor Phonological Awareness Is a Reliable Diagnostic Sign of Serious Reading Disability

The second kind of evidence on the importance of phonological awareness in reading development comes from research that has carefully studied the abilities of older children with reading disabilities. When these children are compared to normal readers on many different verbal and nonverbal skills, they are consistently more impaired in phonological awareness than in any other single ability (Fletcher, Shaywitz, Shankweiler, Katz, Liberman, Stuebing, Francis, Fowler, & Shaywitz, 1994). Even when dyslexic children are compared to younger children who have the same general reading ability, children with reading disabilities perform more poorly on tasks that measure phonological awareness (Stanovich & Siegel, 1994).

Instruction in Phonological Awareness Accelerates Reading Growth

The final type of evidence about the role of phonological awareness in reading is probably the most important. This evidence indicates that specific training in phonological awareness either before reading instruction begins, or during reading instruction, consistently accelerates reading growth for children who receive it. This research has also shown that methods that integrate instruction in letter-sound correspondences in a way that directly links newly acquired phonemic awareness to reading and spelling produce stronger effects on reading than those that do not. While most instructional programs in phonemic awareness begin with oral language activities, most also conclude by leading children to apply their newly developed ability to think about the phonemic segments in words to simple reading and spelling activities.

When we recommend that oral instruction in phonological awareness be accompanied, or followed by print-based activities involving letters, this does not mean that instruction in phonological awareness is useful only if it precedes a systematic and complete phonics curriculum. Although most reading researchers now recommend that reading curriculums should contain a balance of activities including both skills-oriented phonics instruction and meaningful, literature-based activities in reading and writing (Adams, 1990; Beck & Juel, 1995), children in kindergarten need only very simple activities to make the connection between phonological awareness and reading. As will be seen when we review instructional programs, the print-based activities that accompany instruction in phonological awareness are necessarily very simple. For example, children who have been taught a few letter sounds, and who have achieved a beginning level of phonemic awareness, should be able to identify the first letter of a word when they hear it pronounced. They might also be led to substitute different letters at the beginning or end of a word like cat to make different words. They could also be asked to pronounce the sounds of the letters *c*, *a*, *t*, and then blend them together to form a word.

The importance of this progression from oral to written language activities was illustrated in the first major demonstration of the effectiveness of training in phonemic awareness reported by Bradley and Bryant (1985). In this study, phonemic awareness was stimulated by using activities that required children to categorize words on the basis of similarities in their beginning, middle, and ending sounds (sound comparison tasks). However, in one of the conditions, this training was supplemented by work with individual plastic letters to illustrate the way new words could be made by changing only one letter (or sound) in a word. It was children in this latter condition who showed the largest benefit from the phonemic awareness training program. While training in phonemic awareness by itself, can produce significant improvement in subsequent reading growth (Lundberg, Frost, & Peterson, 1988), programs that directly illustrate the relevance of the training to simple reading and spelling activities consistently produce the largest gains in reading (Blachman, Ball, Black, & Tangel, 1994; Byrne & Fielding-Barnsley, 1993; Cunningham, 1990).

Assessment of Phonological Awareness

The primary purpose for the assessment of phonological awareness is to identify children who may require extra instructional help. Although phonological awareness can be effectively stimulated by group activities at the classroom level, there will always be a proportion of children who need more intensive, or more explicit, instruction in order to make adequate growth in this area. In the first part of this section, we will present some general issues involved in selecting and using measures of phonological awareness, and in the second half we present detailed descriptions and information about several measures that are currently available.

When Should Assessment of Phonological Awareness Be Conducted?

In most school programs, teachers should probably wait until the second semester of kindergarten to identify children who may require extra help in this area. When children enter school, their differences in phonological awareness are heavily influenced by their home language environment. Thus, some children may score low on tests of phonological awareness early in the year, but may respond very well to systematic instruction in this area. Particularly when kindergarten children are exposed from the beginning of the year to activities designed to stimulate phonological awareness, by the beginning of the second semester, teachers will have a very good idea of which children are progressing slowly The measures we will discuss in this section can be used to support teacher judgments about the need for extra instruction.

When used in this way, the assessment of phonological awareness in kindergarten can be seen as part of an overall assessment effort to support the prevention of reading problems in young children. As-

Section 2

sessment of phonological awareness in first and second grade children may also be warranted as a means to monitor the development of those who continue to experience difficulties in this area

How Is Phonological Awareness Assessed?

Since researchers first began to study phonological awareness in the early 1970s, more than 20 different tasks have been used to measure awareness of phonemes in words. These measures can be grouped into three broad categories: sound comparison, phoneme segmentation, and phoneme blending.

Sound Comparison

Sound comparison tasks use a number of different formats that all require children to make comparisons between the sounds in different words. For example, a child might be asked to indicate which word (of several) begins or ends with the same sound as a target word (e.g., "Which word begins with the same first sound as *cat*—*boy*, *cake*, or *fan*?"). Additionally, tasks that require children to generate words that have the same first or last sound as a target word would fall in this category. Sound comparison tasks are particularly appropriate for kindergarten-age children, as they do not require as fully explicit a knowledge of phonemes as tasks that require children to pronounce or manipulate individual phonemes.

Phoneme Segmentation

Phoneme segmentation tasks require a relatively explicit level of awareness of phonemes because they involve counting, pronouncing, deleting, adding, or reversing the individual phonemes in words. Common examples of this type of task require pronouncing the individual phonemes in words ("Say the sounds in *cat* one at a time."), deleting sounds from words ("Say *card* without saying the /d/ sound."), or counting sounds ("Put one marker on the line for each sound you hear in the word *fast*.").

Phoneme Blending

Phoneme blending skill has only been measured by one kind of task. This is the sound blending task in which the tester pronounces a series of phonemes in isolation and asks the child to blend them together to form a word (e.g., "What word do these sounds make, /f/ - /a/ - /t/?"). Easier variants of the sound-blending task can be produced by allowing the child to choose from two or three pictures the word that is represented by a series of phonemes.

An important point about these different kinds of tasks is that they all appear to be measuring essentially the same construct, or ability. Although some research (Yopp, 1988) has indicated that the tasks may vary in the complexity of their overall intellectual requirements, and there may be some differences between segmentation and blending tasks at certain ages (Wagner, Torgesen, & Rashotte, 1994), for the most part, they all seem to be measuring different levels of growth in the same general ability (Hoien, et al., 1995; Stanovich, Cunningham, & Cramer, 1984). Sound comparison measures are easier and are sensitive to emergent levels of phonological awareness, while segmentation and blending measures are sensitive to differences among children during later stages of development involving refinements in explicit levels of awareness. Measures of sensitivity to rhyme (which word rhymes with *cat*—*leg* or *mat*?) are not included among measures of phonemic awareness because they appear to be measuring something a little different, and less predictive of reading disabilities, than

those measures that ask children to attend to individual phonemes. For the same reason, measures of syllable awareness are not included in this group.

How Should You Select a Measure to Use in Your Assessment Program?

Although the most commonly used measures of phonological awareness appear to be measuring roughly the same construct, there are usually small differences in their predictive relationships with reading growth. In selecting the best measure to use in your classroom, at least three factors are important in addition to cost.

- Is its degree of difficulty suitable for the children you will assess?
- Does it have adequate measurement reliability?
- What is the evidence for its ability to predict reading growth?

Degree of Difficulty

A given test may be a good indicator of relative strengths and weaknesses in phonological awareness among the children in your classroom and still not be an appropriate measure for your purposes. For example, if you are able to provide extra instruction only to the children who fall in the bottom 20 percent of your class, then you should use a test that is particularly sensitive to differences among children in the lower half of the class. This would probably be a relatively easy measure that does not discriminate well among the strongest children in your class, but which is very sensitive to differences among your weakest students. In contrast, if you used a more difficult measure, it might tell you who had the very strongest phonological skills in your class, but most of the children in the lower half of the class would obtain very low scores so that you could not differentiate among them easily.

If the children in your classroom generally come from backgrounds in which they have had rich pre-school experiences with language and pre-reading activities, then a measure that has a slightly greater degree of difficulty may be most appropriate. In addition if you are likely to be assessing children beyond kindergarten age, then you should select a measure that contains a sufficient number of more difficult items in order to provide sensitive measurement of individual differences beyond beginning levels of phonological awareness

Measurement Reliability

Measurement reliability is simply the degree to which a test provides consistent assessment of a given construct. If a test does not have sufficient reliability, it cannot be counted on to serve as a useful supplement to teacher judgment by providing objective identification of children with different levels of phonological awareness. Test developers calculate reliability in a number of different ways, but it is always expressed as a number between 0 and 1. Generally, tests with reliabilities above .85 will be suitable for assessments to track the development of phonological awareness in individual children, and all of the measures to be discussed in this manual meet this criterion. A test's reliability should always be reported somewhere in the test manual.

Predictive Validity

Since the ultimate purpose for assessment of phonological awareness is to identify children who are likely to experience reading difficulties, it is important that the measure you select present evidence that it is strongly related to reading growth. Predictive relationships between measures of phonological awareness and reading are

usually expressed as **correlation coefficients**.

A correlation coefficient is simply a number, derived from statistical calculations, that expresses the extent to which two variables are related to one another. For variables that are positively related to one another (when one is higher, the other also tends to be higher), such as phonological awareness and reading, correlation coefficients can range between 0 and 1, with predictive correlations for most measures of phonological awareness ranging between .6 and .8.

For practical purposes of identifying children who may be in need of extra support in the development of phonological awareness, small differences in the predictive strength of various measures are of little importance. However, other things being equal (such as cost, time and ease of administration), relative differences in predictive strength should be considered in selecting a measure of phonological awareness to use in the classroom or clinic.

Teachers and psychologists should also be alert to the fact that correlations between tests given concurrently are usually higher than correlations between tests given predictively. Thus, when manuals report the relationship between a given measure of phonological awareness and reading ability, it is important to determine the length of time that elapsed between the administration of the measure of phonological awareness and the administration of the measure of reading skill. Ideally, manuals should report the strength of relationship between measures of phonological awareness administered in kindergarten and measures of reading administered in first or second grade.

Information about Measures of Phonological Awareness

In order to make it easier for you to compare measures of phonological awareness, all the descriptions in this section will be presented in a similar format. The format will include the following information:

- A description of the test including sample items
- Ages for which the test is applicable and issues in administration such as the training required, whether it can be administered in groups, etc.
- Sample items
- Information on test reliability and validity
- Types of scores that are available
- Cost and ordering information (costs are approximate and subject to change)
- General comments about appropriateness for various purposes

To our knowledge, six different instruments are presently available for teachers and other professionals to use in assessing phonological awareness. Some of these instruments have been subject to formal standardization procedures so that a given child can be compared to a random sample of other children of the same age or grade. These instruments, for example, can indicate what percentage of all children in the standardization sample (usually 100 to 200 children of the same age) obtained scores lower than the child who is being assessed. This kind of information is useful in order to estimate how extreme a given child's performance is compared to a large group of other children.

Being able to compare children's performance against that of a broadly based normative sample can also help to indicate what proportion of children in a class or school may be in need of special help to support their growth in phonological awareness. The proportion of children who come to school delayed in the development of phonological awareness will depend somewhat on specific aspects of their preschool language and literacy environment. Tests with national norms can help to pinpoint classes or schools in which a special effort must be made to enhance phonological awareness in children prior to, or during, reading instruction. For example, a classroom in which 75 percent of the children performed below the 20th percentile (in the bottom 20 percent of all children), will require more instructional resources to prepare children for learning to read than a classroom in which only 10 percent of the children scored that low.

A number of tests described in this section do not have normative information to accompany them. Nevertheless, these tests can be useful as informal assessment instruments for teachers to use in monitoring the progress of children in their classrooms. If these instruments are used regularly, teachers will quickly become acquainted with their value in selecting the children who are most at-risk for reading difficulties in their classroom. If classroom resources allow extra help for a fixed number of children (say, 20 to 30 percent), then these measures can be used immediately to identify the group of children within a classroom whose awareness of the phonological structure of words is least developed. Finally, these measures can be very useful in understanding which children are responding well to a given level or method of intervention, and which are not.

Test of Phonological Awareness

(Joseph Torgesen & Brian Bryant, 1994)

Grades K–2

The Test of Phonological Awareness (TOPA) contains two subtests that both involve sound comparison activities. It was designed to provide a simple and efficient way to identify young children who were lagging behind in their development of phonological awareness. It was developed with support of a grant from the National Institute of Child Health and Human Development and is nationally normed. Items were developed to be most sensitive to individual differences in phonological awareness at lower levels of ability.

Cost

$149 for a test manual and 50 test forms and record forms (25 kindergarten version, 25 elementary school version)

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc com

Appropriate Ages and Issues in Administration

The TOPA is appropriate for administration to children in kindergarten through second grade. It is designed to be administered by teachers or paraprofessionals, but those administering the test must be able to speak clearly and pronounce individual phonemes correctly.

There are two versions of the test, one for children in kindergarten (Kindergarten Version), and one for children in first and second grade (Early Elementary Version). Both versions come in the same test kit. The TOPA can be given either in groups or individually and takes from 15 to 20 minutes to administer. The entire testing can be done in one session or spread across two sessions, depending upon the time available for testing and children's attentional capacities.

Sample Items

The Kindergarten Version consists of 20 items that involve comparison of the first sounds in words. The first set of 10 items requires children to indicate which of three pictures begins with the same first sound as a target word, and the second set of 10 items asks them to indicate which of four pictures begins with a different first sound than the others.

After going through some brief exercises to ensure the children understand the meaning of same and different, as well as how to mark the items, they are shown three example items such as the one below. Directions that go with this type of item, referred to as Initial Sound—Same, are: "Look at the first picture. The first picture is a *bat*. Now look at the other three pictures: *horn, bed, cup*. Mark the one picture that begins with the same sound as BAT (pause). You should have marked BED because BAT and BED begin with the same sound, /b/."

The other type of item on the Kindergarten Version of the TOPA is called Initial Sound—Different. An example of this type of item and the directions that go with it are: "Look at the pictures, *knife, fork, neck, nest* Mark the one picture that has a different first sound than the other three. (pause). You should have marked FORK, because KNIFE, NECK, and NEST start with the same sound, /n/. FORK begins with a different sound, /f/."

The only difference between the Kindergarten and Early Elementary Versions of the TOPA is that in the Early Elementary Version comparisons are made between the last sounds in words rather than in the first sounds. Attending to last sounds in words is more difficult than first sounds, thus the items on the Early Elementary Version are more difficult.

Reliability

The test manual provides two types of test reliability information for the TOPA. Internal consistency reliabilities average 90 between kindergarten and second grade (ages 5 through 7). The test-retest reliability, with six weeks between testings, for the Kindergarten Version was .94, while for children in the beginning of first grade, it was .77 over eight weeks. The lower test-retest reliability of the Early Elementary Version may reflect the impact of reading instruction from which some children profit more than others

Validity

The manual gives values for both concurrent validity and predictive validity. The reported correlation between the Early Elementary Version of the TOPA and a measure of phonemic reading ability (The Word Attack Subtest from the Woodcock Reading Mastery Test-Revised) in November of first grade was 66. When the Kindergarten Version of the TOPA was given in April to a sample of children from an elementary school serving an area with relatively low socioeconomic status and heavy minority population, the correlation with phonemic reading ability a year later was .62 Both of these values indicate that the TOPA is sufficiently predictive of early reading difficulties to warrant use as a means to identify children in need of special intervention to help prevent later reading problems.

Scores

Because the TOPA was normed on a national sample of children, a variety of scores can be derived to show how an individual child compares to other children the same age. These scores include both percentile and several types of standard scores.

General

The TOPA is an excellent test for use in identifying kindergarten children who are lagging behind their peers in the development of phonological awareness. It is particularly useful for classroom teachers because it can be administered to groups of children. It may also be used to identify children who are struggling with phonological awareness in first and second grade but will not be sensitive to differences among children in the upper half of the distribution because even in the Early Elementary Version, the items are too easy

The Phonological Awareness Test

(Robertson & Salter, 1997)

Ages 5 years +

The Phonological Awareness Test (PAT) contains five measures of phonological awareness, plus measures of word and syllable segmentation and a measure of sensitivity to rhyme. It also contains three additional subtests that measure knowledge of letter-sound correspondences, phonemic decoding (ability to read phonetically regular nonwords), and invented spelling. It is really a comprehensive test of phonological sensitivity and phonemic reading ability. All tests were normed on a national sample of children ranging from five to ten years of age.

Cost

$109.95 for a test manual, test supplies, and 15 test booklets

Ordering

LinguiSystems
3100 4th Avenue
East Moline, IL 61244-0747
800-776-4332
www.linguisystems.com

Appropriate Ages and Issues in Administration

The PAT can be given to children five years of age and older. Although norms extend only through age nine, the authors believe information useful for planning instruction may be obtained for children older than ten. The test should be given by someone who is professionally trained in analyzing the phonological structure of speech, such as a language pathologist, learning disability teacher, reading specialist, or special education consultant. The test must be given individually, and it takes about 40 minutes to administer when all subtests are given. Administration time can be cut substantially by administering only a few of the subtests, although this will reduce somewhat the reliability of the testing.

Sample Items

Although the PAT contains measures of sensitivity to rhyme, as well as ability to segment words and syllables, these subtests will not be discussed here because, as was discussed in an earlier portion of this manual, they appear to provide measures of slightly different constructs than measures that assess awareness at the level of phonemes. The five measures of phonemic awareness on the PAT include the following:

Segmentation of Phonemes

Sample item: "I'm going to say a word, and then I'll say each sound in the word. Listen carefully. *Cat.* (Say the individual sounds, pausing slightly between each one /c - a - t/.)

"Tell me each sound in *off*."

The child receives credit if all sounds are given in the proper order. There are ten items.

Isolation

Sample item· "I'm going to say a word, and I want you to tell me the beginning or first sound in the word. What's the beginning sound in the word *cat*?" /k/

There are 10 items each that ask the child to pronounce either the first, last, or middle sound of short words.

Deletion

Sample item: "I'm going to ask you to say a word and then to say it again without one of its sounds. Say *cat*." (Student says *cat*.) "Now say it again, but don't say /k/." (at)

There are 10 items

Substitution

Sample item. The first part of this subtest requires the use of colored blocks to show the different sounds in words. The examiner says, "I'm going to show you how to make the word *fun* with these blocks. Each block is one sound of the word " The examiner illustrates the relationship between blocks and sounds by teaching each block while saying /f/ - /u/ - /n/. The examiner then says, "Now, watch how I change *fun* to *run*." This change is illustrated by replacing the first block with a different colored block. "Now it says *run*." There are ten test items that require children to show which sounds have changed on examples like *map* to *mop*, or *tip* to *tick*.

There are also 10 test items that do not involve blocks On this type of item, the examiner asks the child to change a given sound, /p/, in a word like *paint*, to another sound, /f/, to produce another word (*faint*). Another example would be, "Say *cow*, now change /k/ to /h/." (*how*)

Blending

Sample item: "I'll say the sounds of a word. You guess what the word is. What word is this?" Then the phonemes /p/ - /o/ - /p/ are pronounced at one per second. The child must pronounce the word correctly in order to receive credit

There are ten items.

Reliability

Estimates of both test-retest and internal consistency reliability are provided in the manual. The values reported here are those that apply to the section of each subtest that measures awareness at the phonemic level. In the manual, reliabilities are reported at half-year age intervals between 5 and 10 years of age Here, we report the average values across all ages.

Subtest	Test/Retest	Internal Consistency
Segmentation	.71	.81
Isolation	.72	.89
Deletion	.71	.73
Substitution	.77	.82
Blending	.76	.74

Measurement reliability would undoubtedly be improved if more than a single subtest were used to estimate the level of phonological awareness at any given age. However, because of the way the reliabilities are reported in the manual, it is not possible to estimate the overall measurement reliability of combinations of subtests assessing phonemic awareness.

Validity

Values for the predictive validity of the PAT are not reported in the manual. Concurrent validity was established by contrasting the performance of groups of randomly selected children from the normative sample with samples of children who were identified as at-risk for reading problems or as having reading problems. The total score on the PAT successfully discriminated between these two groups at five age levels between five and ten. The five individual measures of phonemic awareness also successfully discriminated between these groups in 23 of 25 comparisons The only nonsignificant differences were for the segmentation and isolation subtests at the oldest age levels.

Scores

Since the PAT has been normed on a large sample of children, both percentile and standard scores can be derived at all ages between five and ten. One potentially useful feature is that these types of scores can be derived for each subtest as well as for performance on the total test.

General

The PAT is a well-constructed, comprehensive measure of phonological awareness and phonemic reading skills. Although the letter knowledge and reading tests were not discussed in this manual, they may provide a very useful addition for professionals who wish to assess both phonemic awareness and print knowledge at the same time. Both the predictive validity of the overall test and the specific utility of the word, syllable, and rhyme level tests will need to be demonstrated in further research with the instrument. However, there can be little doubt that a combination of measures at the phonemic level from this instrument will provide a very useful assessment of individual differences in children's level of phonemic awareness.

Lindamood Auditory Conceptualization Test

(Lindamood & Lindamood, 1979)

Kindergarten–Adult

The Lindamood Auditory Conceptualization Test (LAC) has been used widely in clinical work with children with reading disabilities for many years. The test provides "recommended minimum scores" for grades kindergarten through sixth grade, with a separate estimate for the range of seventh grade to adult. These estimates are based on the author's extensive clinical experience with the test, and they suggest that children who score below these levels will likely have difficulties acquiring phonetic decoding skills. The test requires children to indicate the number, identity, and order of phonemes in words using colored blocks.

Cost

$98 for complete kit

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc.com

Appropriate Ages and Issues in Administration

The LAC can be given to children as young as kindergarten age and can also be administered to adults. A more difficult version of the LAC is currently being developed which will provide finer discriminations of individual differences in phonological awareness in older children and adults. The test can be given by anyone who has been trained in its use However, some parts of its administration are complex and require careful feedback to the person being tested, so sufficient time must be budgeted to learn proper administration procedures. The test must be given individually and, depending on the age of the child, takes between 15 and 25 minutes to administer.

Sample Items

The LAC has two levels, Category I and Category II. Category I items are included primarily to determine whether the child can understand how to represent the number, order, and identity of sounds with colored blocks, and Category II actually assesses phonemic awareness.

The child begins with some preparatory items designed to help him or her understand the directions for the test. The child is requested to do such things as, "Show me three blocks that are the same color," or "Show me three blocks, and make only the first and the last one the same." On these items, the examiner is supposed to provide various types of instructive feedback.

Category I items begin with the instruction, "I want you to use these blocks to show me how many sounds I make, and whether they are the same or different." The examiner then says /z/ -/z/, and demonstrates that the child should place two blocks of the same color. After several instructive

items of this type, the child performs items varying in difficulty from "Show me /p/-/p/-/p/", to "Show me /t/-/t/-/ch/."

Category II items require the child to represent the order, number, and identity of sounds in syllables with colored blocks. After thoroughly demonstrating what is required, the child starts with an item like, "show me /i/." If the child correctly places one block, the next item is, "If that says /i/, show me /ip/." A series of 12 increasingly difficult items is chained together in this manner, until the final two items, which are "If that says /aps/, show me /asp/." And then, "if that says /asp/, show me /sasp/."

Reliability

The manual for the LAC presents strong evidence for its concurrent and predictive validity, but the information on test reliability is weakened by the use of inappropriate statistical analyses. The only reliability value reported is a test-retest correlation (.96), and this number is spuriously inflated because it was derived from testing four children at each age level from kindergarten to 12th grade on alternate forms of the test. Including children with such a wide age span in the reliability sample artificially inflates the reliability estimate because there is such a large age-related difference in performance among the children.

Validity

The manual provides extensive information on concurrent validity of the LAC as well as an estimate of predictive validity. The LAC and the reading portion of the Wide Range Achievement Test, which is a measure of word-reading ability, were given to groups of children from kindergarten to 12th grade. The average correlation between the LAC and the reading test was .73, with values for each age ranging from .66 to .81. In terms of predictive validity, the manual reports values ranging from .88 to .98 for relationships between the LAC test administered in September of first grade and reading at the end of first grade as measured by several different tests.

Scores

Since the LAC test has not undergone formal norming procedures, percentile and standard scores are not available However, the authors do provide values for "recommended minimum scores" at each age level from kindergarten through sixth grade, with a separate estimate for adults. These scores are provided to "encourage educational follow-up that is preventative as well as remedial in nature." The authors supplement these recommended minimum scores with extensive case discussions to illustrate the meaning of scores in various ranges on the LAC.

General

The LAC provides an excellent assessment of phonemic awareness in older children and adults. Its use as a screening instrument in kindergarten is limited by both the complexity of the test itself, and the time and training required to administer it. It is recommended for use as part of a diagnostic battery to examine the reasons for reading failure in children second grade and older.

Yopp-Singer Test of Phoneme Segmentation

(Yopp, 1995)

Kindergarten–Grade 1

The Yopp-Singer Test of Phoneme Segmentation is a brief test of children's ability to isolate and pronounce the individual phonemes in words. Phoneme segmentation is a task that has been widely used in research on phoneme awareness over the last 20 years, and it is highly correlated with other measures of phoneme awareness (Yopp, 1988). The test is very easy to give, score, and interpret.

Cost

Free by copying from the journal article listed below or from page 23 of this manual

Ordering

Copy from:

Yopp, H. K. (1995). A test for assessing phonemic awareness in young children, *The Reading Teacher, 49*, 20-29.

Appropriate Ages and Issues in Administration

This test was designed for kindergarten children, but should also be appropriate for identifying children who are weak in phonological awareness during first grade. It can be administered by teachers or paraprofessionals, and must be given individually. It takes 5 to 10 minutes per child. It does not have norms

Sample Items

The test consists of 22 items that are all of the same type. Beginning the test, the child receives the following instructions: Today we're going to play a word game. I'm going to say a word, and I want you to break the word apart You are going to tell me each sound in the word in order. For example, if I say *old*, you should say "/o/-/l/-/d/." (The administrator says the sounds, not the letters.) Let's try a few words together."

The practice items are ride, go, and man. All the items involve familiar words of just two or three phonemes.

Reliability

The article in which the test is described reports an internal consistency reliability of .95

Validity

The Yopp-Singer test has impressive validity data derived from a seven-year longitudinal study in which the same children that were administered the phoneme segmentation test in kindergarten were followed through sixth grade. (See Table 1 on the following page.) The segmentation test was administered in the second semester of kindergarten, and the table below gives the correlations between the test and various reading measures. All of the read-

ing measures came from the Comprehensive Test of Basic Skills (CTBS, 1973). The Word Attack subtest measures phonetic reading skills and recognition of sight words The Vocabulary subtest measures children's ability to identify a word associated with an orally presented category or definition, and the Reading Comprehension test measures children's reading comprehension for both sentences and stories. The Total Score is the combined score on all the measures. The thing that is most impressive about these results is the continuing strong predictive relationship with reading growth through the end of sixth grade. A correlation of .74 with total reading score means that performance on the Yopp-Singer test in the second semester of kindergarten is highly correlated with overall reading ability six years later.

Scores

This test has not been normed; only raw scores can be obtained.

General

The major difficulty with the Yopp-Singer test is that it may be too difficult to make fine discriminations among children in the lower ranges of phonemic awareness. The requirement to completely segment the word *dog* (first item on the test) may simply be too difficult for many populations of children. Although Yopp reports mean performance on the test of about 11 items correct in the second semester of kindergarten (children with average age of 70 months), her sample, as a whole, may have been stronger in phonemic awareness than many groups around the United States. For teachers who work with groups of children who have traditionally had high rates of reading problems, this test may be too difficult in kindergarten to discriminate among children in the lower ranges of ability.

Other than the issue of difficulty level for some groups of kindergarten children, this is a fine, reliable test of phonemic awareness. It could serve very usefully, for example, to monitor the growth of phonemic awareness in first-grade children as they learn to read.

Table 1: Relationship of Yopp-Singer Test to Later Reading Scores

Grade Level	Word Attack	Vocabulary	Comprehension	Total
1	.46	.66	.38	.62
2	.62	.72	.55	.67
3	.56	.66	.62	.67
4		.51	.62	.58
5		.56	.57	.59
6		.78	.66	.74

Yopp-Singer Test of Phoneme Segmentation

Student's name _____ Date _____

Score (number correct) _____

Directions: Today we're going to play a word game. I'm going to say a word, and I want you to break the word apart. You are going to tell me each sound in the word in order. For example, if I say *old*, you should say /o/-/l/-/d/." (Administrator. Be sure to say the sounds, not the letters, in the word.) "Let's try a few words together."

Practice items: (Assist the child in segmenting these items as necessary.)

ride, go, man

Test items: (Circle those items that the student correctly segments; incorrect responses may be recorded on the blank line following the item.)

1. dog _____
2. keep _____
3. fine _____
4. no _____
5. she _____
6. wave _____
7. grew _____
8. that _____
9. red _____
10. me _____
11. sat _____
12. lay _____
13. race _____
14. zoo _____
15. three _____
16. job _____
17. in _____
18. ice _____
19 at _____
20. top _____
21. by _____
22. do _____

Note. From "A Test for Assessing Phonemic Awareness in Young Children," by H. K. Yopp, 1995, *The Reading Teacher, 49*, 20-29. Reprinted with permission.

Rosner Test of Auditory Analysis

(Rosner, 1975)

Kindergarten–Elementary

The Rosner Test of Auditory Analysis is the oldest published test of phonemic awareness, and it has been widely used in research. It is a relatively brief test (13 items) involving the deletion of phonemes from words, and it is very easy to give, score, and interpret.

Cost

Provided in the book referenced below, which costs about $20 new. An older version is available on pages 27 and 28 of this manual.

Ordering

Rosner, J. (1993). *Helping children overcome learning difficulties* (3d ed). New York: Walker & Company. ISBN #0802773966.

Widely available new and used from bookstores and libraries.

Appropriate Ages and Issues in Administration

The test can be given to children from kindergarten through late elementary school but will be most sensitive to individual differences in phonemic awareness among children in kindergarten, first, and second grades. It can be administered by teachers or paraprofessionals and takes about 5 to 10 minutes to complete. The only difficult part in administration is learning to pronounce individual phonemes properly.

Sample Items

The test begins with items involving segmentation of compound words and syllables, but rapidly shifts to items involving deletion of phonemes. Directions for the first practice item are: "Let's play a word game. Say *cowboy*. (Allow child to respond.) Now say it again, but don't say *boy*." The child should respond with the word *cow*.

Sample items involving phoneme deletion are: "Say *coat*. Now say it again, but don't say /k/," and, "Say *stale*. Now say it again, but don't say /t/." The correct answers for these two items, respectively, would be oat and sale.

Reliability

Rosner does not present information on reliability in his description of the test. However, tests used in research that include items very similar to those on the Rosner test report acceptable levels of reliability (Wagner, Torgesen, & Rashotte, 1994).

Validity

Again, Rosner does not present formal information about the predictive validity of this test, but numerous studies have found

that these types of items not only are strongly predictive of reading failure in young children (Wagner, Torgesen, & Rashotte, 1994), but also are very sensitive in differentiating older children who have reading disabilities from children who read normally (Fletcher, et al., 1994).

Scores

Since this test is not normed, only raw scores are available. The author does provide values for "expected" performance at various age levels, based on his experience giving the test to many children. For example, scores from 1-3 would be expected in kindergarten, 4 to 9 in first grade, and 10 to 13 in second grade.

General

This test is an excellent one to use for a quick assessment of relative levels of phonological awareness within kindergarten, first, and second grade classrooms. The only drawback in its use is the absence of norms, but that should not prevent teachers from finding it useful in identifying children within their classrooms whose phonemic awareness is least well-developed.

Rosner Test of Auditory Analysis

(Rosner, 1975)

Materials Needed

List of items to be administered to the child

Directions

Practice: " Lets play a word game. Say *cowboy*. (Allow child to respond) Now say it again, but don't say *boy*."

If correct: That's right, Let's try the next one.

If incorrect: "That's not quite right. *Cowboy* without saying boy is *cow*." (Then see if you can explain it to the child. If the child requires more than a simple explanation, stop testing.)

Second Practice Item: "Say *steamboat*. (Wait for response.) Now say it again, but don't say *steam*."

If the child answers both demonstration items correctly, start the test with item 1. If he/she does not answer both demonstration items correctly, do not administer any more items.

Administration Notes

1. Do not give hints with your lips. Speak distinctly, but do not stress any particular sounds. In other words, do not give any additional information that might make the task easier. You want the child to do well but not at the expense of looking better on the test than is really the case
2. Remember, when you get to the items that ask the child to "Say the word, but don't say /..../ (a single sound)" you are to say the sound of the letter, not the letter name.
3. Stop testing after two successive errors—two incorrect responses in a row—and record the number of the last correct item before those two errors. This is the score. For example, if the child is correct on items 1, 2, 3, 4, and 5, and incorrect on items 6 and 7, his/her score would be 5. If he/she was correct on 1, 2, 3, incorrect on 4, correct on 5 and 6, then incorrect on 7 and 8, his/her score would be 6.

Interpreting the Results

The following expected scores were not based on a formal norming procedure, but rather on the author's experience in administering the task to children of various ages. Although they can be used as an initial guide to expected performance at various age levels, the test will be most accurately used to identify children with delays in phonological awareness if this information is supplemented with local norms.

Expected scores:	Kindergarten	1-3
	1st Grade	4-9
	2nd Grade	10-13

Test Items

		Answer	Corr/incorr
1.	Say SUNSHINE. Now say it again, but don't say SHINE.	SUN	_____
2	Say PICNIC. Now say it again, but don't say PIC.	NIC	_____
3.	Say CUCUMBER. Now say it again, but don't say CU (q)	CUMBER	_____
4.	Say COAT. Now say it again, but don't say /k/.	OAT	_____
5.	Say MEAT. Now say it again, but don't say /m/.	EAT	_____
6.	Say TAKE. Now say it again, but don't say /t/	ACHE	_____
7.	Say GAME. Now say it again, but don't say /m/.	GAY	_____
8.	Say WROTE. Now say it again, but don't say /t/.	ROW	_____
9.	Say PLEASE. Now say it again, but don't say /z/	PLEA	_____
10.	Say CLAP. Now say it again, but don't say /k/	LAP	_____
11.	Say PLAY. Now say it again, but don't say /p/	LAY	_____
12.	Say STALE. Now say it again, but don't say /t/	SALE	_____
13.	Say SMACK. Now say it again, but don't say /m/	SACK	_____

Last item before two errors in a row _____

Note. From *Helping Children Overcome Learning Difficulties* (p. 47), by J. Rosner, 1975, New York: Walker and Company. Reprinted with permission.

Test of Invented Spelling

(Mann, Tobin, & Wilson, 1987)

Kindergarten

The Test of Invented Spelling actually measures more than simple phonemic awareness. Since it requires children to "represent as many of the sounds in words as they can" by spelling them, it also assesses knowledge of sound-letter correspondences. It is included here because it is very sensitive to individual differences in phonemic awareness and may actually be more predictive of later reading growth than many purely oral measures of phonemic awareness (Mann, 1993).

Cost

Free by copying from the article listed below and on page 31 of this manual. (To obtain a complete understanding of the test and its appropriate uses, we recommend reading the original article that reports its development.)

Ordering

Copy from:

Mann, V. A., Tobin, P., & Wilson, R. (1987). Measuring phonological awareness through the invented spellings of kindergarten children. *Merrill-Palmer Quarterly, 33*, 365-89.

Appropriate Ages and Issues in Administration

The test is designed for children during the second semester of kindergarten or as soon as they have acquired some rudimentary knowledge of letter-sound correspondences This kind of test may not be appropriate once children begin formal instruction in spelling, as many of the words would simply be spelled correctly because they had been memorized. The test can be administered by teachers or paraprofessionals to groups of children in less than 10 minutes. The scoring of the test is relatively complicated and requires a good understanding of phonetic relationships in spelling.

Sample Items

Directions can be adapted to the circumstances of test administration, but would go something like this: "I want you to try to write some words for me. I will say a word, and you should write it as best you can. If you cannot write the whole word, write any of the sounds that you hear, and any of the letters that you think might belong in that word." The first word on the test is red, followed by name, bed, and lady. There are 14 words on the test.

Reliability

Mann does not report reliability figures for this test, but the strength of its relationships to later reading development suggest that is probably at least as reliable as most of the phonological awareness measures used with kindergarten children.

Validity

The predictive validity of the Test of Invented Spelling was assessed in a study in which the spelling test was given in the second semester of kindergarten, and reading was assessed one year later. The

correlation between the measure of invented spelling and phonetic reading ability was .61, while the correlation with general word-reading ability was .68. Both of these relationships are sufficiently strong to warrant the use of this measure to identify children at-risk for reading difficulties.

Scores

Since the test is not normed, only raw scores are available Based on her experience with the measure, Mann (1993) suggests that scores below five at the end of kindergarten indicate a pronounced risk for reading problems in first grade.

General

One very desirable feature of this test is that it can be given quickly to groups of children. In kindergarten classes, where children are expected to know some of their letter sounds, it provides a very good way to assess both phonological awareness and beginning knowledge about print. At the beginning of first grade, for example, this might be a very good way to identify children most at risk for reading difficulties during the year. The test will not be sensitive to individual differences in phonological awareness in groups of children that have very limited knowledge of letters and their sounds.

Test of Invented Spelling

(Mann, Tobin, & Wilson, 1987)

Materials Needed

List of words to be spelled and a numbered response form containing 14 triple spaced lines

Directions

This test can be administered to small groups of students. The teacher could introduce the test by saying, "I want you to try to write some words for me. I will say a word and you should write it as best you can. If you cannot write the whole word, write any of the sounds that you hear, and any of the letters that you think might belong in that word."

"Ready? OK, here is the first word." (Read each word aloud twice and wait as the children respond.)

Word List

1. red 2. name 3. bed 4. lady 5. fish 6. men 7. boat 8. girl 9. color

10. angry 11. thank you 12. people 13. dog 14. boy

Phonological Scoring System

Each response is assigned a score between 0 and 4. No points are awarded if no letters are given or if the letters fail to capture any phonological element of the target word. One point is given for a response in which the first letter (or only letter) represents the first phoneme in the word. One half point is given for a single letter corresponding to any phoneme except the first. Two points are given if the response represents at least two phonemes. Three points are given if all phonemes are represented, but the word is not spelled correctly. Some leniency is allowed in using the correct letters for specific sounds, since the goal is to evaluate the child's awareness of the sounds in the word. Four points are awarded when the response is correct by conventional spelling standards. The maximum possible score is 56.

Scoring examples: red: r (1), rd (2), d (1/2); name: nam (3); fish fis (3); angry: agre (2), angre (3); people: ppl (2), peepl (3), thank you: thak u (2), tank u (3)

Expected Scores

The test was given to a group of predominantly white, middle class children in May of the kindergarten year, and the average phonological score was 21 About 68 percent of the children obtained scores between 9 and 33. Mann suggests that scores below five at the end of kindergarten indicate a pronounced risk for reading problems in first grade. However, this must be verified with a larger, more diverse sample.

Note. Reprinted from "Measuring Phonological Awareness through the Invented Spellings of Kindergarten Children," by V. A. Mann, P Tobin, & R Wilson, 1987, *Merrill-Palmer Quarterly, 33*, 365-89. Reprinted with permission.

Instruction in Phonological Awareness

In this section, we will describe 13 instructional programs that focus on building phonological awareness in young children. Some of these programs are intended for use in the regular classroom setting, while others were designed for small group or individual instruction with children who require more intensive or explicit instruction in phonological awareness. In addition, we will also evaluate 34 different "pre-reading" computer software programs currently being marketed for home and school use for their potential to stimulate phonological awareness. Before we present information about specific programs, however, we want to review both the goals of instruction in phonological awareness and some general teaching issues in this area.

Goals of Instruction in Phonological Awareness

Instruction in phonological awareness has two primary goals. The first objective is to help children notice the phonemes in words, to discover their existence and distinctness. The second goal is to help children make the "connection" between the phonemes in words and the letters of the alphabet. Good instruction in phonological awareness should help children all the way to the discovery of the alphabetic principle Thus, although all phonological awareness training programs begin with oral language activities designed to help children attend to the individual sounds in words, they all should end, or overlap, with very simple "phonics" activities designed to show children how the sounds in words are represented by letters.

Section 3

When children learn to speak their native language, most of their focus is on acquiring the meaning of words. They are occasionally corrected in their pronunciations, but the primary object of language learning is to understand the meaning of words in conversation. Because of the human capacity for language, the brain processes the phonemes in spoken words automatically, and the child does not have to be consciously aware of them as individual sounds in order to understand speech. However, if a child is to understand the way words are represented by print, he/she must become aware that words are made up of the individual sounds called phonemes. Thus, the first goal of instruction in phonological awareness is to provide activities that help to focus children's attention on the individual sounds in words. Good instruction in phonological awareness will help children learn to notice the identity, number, and order of sounds in words.

Although many children will automatically make the connection between the phonemes in oral language and the letters in print, many others will be helped significantly if this connection is made explicitly for them through direct instruction. Thus, after children have acquired the ability to identify and segment individual sounds in words, they should be explicitly taught the connection between these sounds and letters. In addition, they should be provided beginning practice activities on very simple reading and spelling tasks For example, towards the end of one excellent instructional program, children are taught a set of consonants and vowels that can be used to create a large number of three-letter words. The children then engage in a variety of discovery and practice activities that allow them to acquire beginning skills in sounding out simple printed words and in spelling similar words by first segmenting the sounds and then using letters to represent the sounds. The important thing to remember is that the effectiveness of all instruction in phonological awareness will be improved if the connection between the phonemes in oral language and the letters in print is made very explicitly and directly.

General Issues In Teaching Phonological Awareness

In this section, we are simply going to list some of the most important general points about instruction in phonological awareness. Many of the instructional programs we will describe later contain similar discussions, but we thought it would be useful to extract the most general issues that apply to all programs and present them here.

Instruction in phonological awareness should begin with easier tasks and move toward more difficult tasks.

This is so obvious, it almost goes without saying. However, it is important to note that explicit instruction in phonological awareness is developmentally appropriate for children as young as five years old only if the concept is taught in a carefully structured way. While we do not yet know precisely all of the potentially important steps in this instruction, we do have a broad outline of the most important steps. For example, many programs begin with general listening activities designed to help children attend to sequences of individual sounds, and then move to activities that help children become aware of words in sentences and then syllables in words. Other programs begin with activities involving rhyme in order to help children begin to focus on the sounds in words in addition to their meaning.

Instructional programs can follow a variety of paths after these initial, introductory activities, but it may be easiest for children to move next to activities that involve comparing words on the basis of first, last, and middle sounds. These sound comparison kinds of tasks do not require as fully explicit an awareness of sounds as is required by tasks that involve segmenting and pronouncing individual phonemes. Once children have some beginning proficiency with sound comparison tasks, they can be moved to training activities that involve segmenting beginning sounds and blending of onset-rhyme patterns (e g., c-at, d-og). The final series of tasks should be those that involve completely segmenting the sounds in simple words, or blending all the sounds, or manipulating the sounds in words (e.g., "what word do we have if we say *cat*, but don't say the /k/ sound?").

Instruction in phonological awareness should be a *regular* part of the curriculum.

In the case of whole class instruction, activities to build phonological awareness should take place for 15-20 minutes every day throughout the entire kindergarten year. The daily focus on these activities will produce much more consistent growth than sporadic involvement or casual instruction that occurs at irregular intervals For children who require more intensive instruction, small group or individual tutoring should be provided on a daily basis. One intensive program, for example, involves small group instruction delivered every day in half-hour sessions for about 12 weeks.

Teachers should expect that children will respond at widely varying rates to instruction in phonological awareness.

Depending upon their talent for processing phonological information or previous experience with rhyming and letter activities, children will show very different rates of progress in the growth of their phonological awareness. Not only should classroom instructional activities be planned to accommodate wide differences in phonological ability among children, but provision should be made to identify children who will require more intense or more explicit instruction. By the beginning of the second semester of kindergarten, it should be very clear to teachers which children will require more intensive instruction, and these children should be taught in small groups or individually.

Instruction in phonological awareness should involve both analytic and synthetic activities.

Analytic activities are those that require children to identify individual sounds within whole words (e.g., "Tell me some words that begin with the same sound as *dog*." "What is the first sound in man?" Or, "If you say *man* without saying the /m/ sound, what word do you get?"). In contrast, synthetic activities involve blending together separately presented phonemes ("What word do these sounds make, /f/-/a/-/t/?"). Both of these kinds of skills with phonemes are important in learning to read and spell.

Since the first goal of instruction in phonological awareness is to help children notice the individual sounds in words, teachers should speak slowly and carefully and pronounce individual sounds correctly.

This is not as easy as it sounds. Often, the ability of teachers who have become good readers and spellers to "hear" individual sounds in words is distorted by their knowledge of a word's spelling. For example, they may feel that they hear four sounds in the word *church* because of the extra consonant after the vowel, but in

fact, the letters *u* and *r* are blended into a single sound in this word. It would be a mistake to expect children to blend together the sounds /ch/-/u/-/r/-/ch to obtain the word *church*. Similarly, teachers may think there are four sounds in the word *pitch* because of the presence of the letter *t*, while, in fact, the word *pitch* rhymes with *rich*.

It is not easy to pronounce individual phonemes correctly without some careful practice.

Even then, it is impossible to pronounce phonemes individually without some distortion because in speech they are always co-articulated with other phonemes. In order to help children learn about the identity of individual phonemes, our goal in instruction should be to keep this distortion to a minimum. Some phonemes are harder to pronounce in isolation than others. In the chart at the end of this section, we have listed the consonant phonemes together in three groups according to the difficulty they present in individual pronunciation. We have also given a few simple suggestions that may help teachers pronounce them properly during instruction.

Instruction in phonological awareness should be fun for teachers and students.

When children learn about the sounds in words, they are making discoveries about their language. One has only to observe the delight that children take in rhyming stories and rhyming games to know that playing with the sounds in words can be fun. Most of the training programs discussed in this manual embed activities to enhance phonological awareness in game-like contexts. If kindergarten phonological awareness instruction is not fun, it is not being done properly.

Pronunciation Suggestions for Individual Phonemes

Easy to Pronounce

/m/ (man)
/n/ (nose)
/f/ (face)
/v/ (vase)
/sh/ (shop)
/sh/ (division)
/s/ (safe)
/z/ (zebra)
/th/ (think)
/th/ (the)

Pronunciation Notes

These phonemes can all be "stretched out" without distorting them very much. The main thing to remember for phonemes such as /f/, /sh/, /s/, and /th/ is that the vocal cords are not used when making the sounds, so you need to put enough "air" into the pronunciation to be easily heard.

Slightly Harder to Pronounce

/t/ (talk)
/p/ (pink)
/k/ (kite)
/ng/ (ring)
/l/ (lap)
/ch/ (cheek)
/w/ (water)
/wh/ (what)
/h/ (help)

Pronunciation Notes

- Some of these phonemes, such as /t/, /p/, /k/, /ch/ are hard because we need to learn to pronounce them strongly as "whispers." The vocal cords are not vibrating while we pronounce these sounds, so we should not say, for example, *tuh*, or *puh*, or *kuh* with a vowel sound following the phoneme.

- Teachers also have a tendency to pronounce /l/ as luh, but this will make it hard for children to blend the sound with other phonemes during sound-blending activities. You do not need to follow the /l/ sound with a vowel—just bring your tongue to the top of your mouth (behind the front teeth) and leave it there as you say the sound).

- The /ng/ sound is just hard to get used to saying by itself. The best way to practice saying it is to say a word like *ring*, and then notice what your mouth is doing at the end of the word. When you say the sound /ng/, put your mouth in the same position, and use your vocal chords.

- The sound /h/ is difficult just because you need to get enough energy in your "whisper" (do not follow it with a vowel by saying huh) in order to be heard. You should be blowing a lot of air out when you say /h/, but should not be using your vocal chords.

- Finally, the sounds /w/ and /wh/ are often confused with one another, particularly in Southern dialects. Thus we often pronounce words like *what* and *win* as though they begin with the same first sound. In reality, the sound /wh/ should be pronounced with no vocalization (with just air coming out), while the /w/ sound is vocalized from the beginning. In reality, this distinction is important primarily for spelling (if the words *where* and *were* are pronounced properly, it is obvious from listening to them that one begins with *wh* and the other a *w*.) However, in order to avoid confusion when letter sounds and spelling are introduced, it may be best to avoid words with the /wh/ phoneme during instruction in phonological awareness.

Hardest to Pronounce

/d/ (dog)
/b/ (big)
/g/ (gone)
/r/ (run)
/j/ (jump)

Pronunciation Notes

- The primary difficulty with the phonemes /d/, /b/, /g/, and /j/ is that we need to vocalize (make our vocal chords vibrate) while we say them, and we often have a tendency to lengthen out the resulting vowel sound too much. Thus, we say duuuh for /d/, and buuh for /b/ The art of good pronunciation with these phonemes is to make that vowel sound as short as possible.

- The phoneme /r/ is probably the hardest one to pronounce in isolation. Typically, teachers pronounce it in one of two ways. It can be pronounced with a vowel sound at the beginning, as in *errrr*, or the vowel sound can follow, as in ruh. The pronunciation that is usually most helpful is similar to *ruh*, as long as the vowel part is very short. For example, if you are asking a child to blend the sounds in *run*, it would be a mistake to say /err/-/u/-/n/, because then the child would be led to say *errun*. Words in which the vowel sound come before the /r/ are most usually words like *hurt*, *dart*, *her*, or *corn*, that contain what is called an r-controlled vowel When blending these words, the teacher would say, for example, /k/- /or/- /n/ for corn.

Short Vowels

/a/ apple
/e/ eskimo
/i/ indian
/o/ octopus
/u/ umbrella

Pronunciation Notes

- The major difficulty presented by vowel sounds is that their pronunciation varies a lot with dialect. They are pronounced somewhat differently in various regions of the country, and there may be a mismatch between the way the teacher pronounces them and the way children in the class pronounce them. As long as the teacher allows reasonable latitude, this does not present as much of a problem in phonological awareness training as it does when children begin to learn the sounds associated with various letters.

- At some point, it may be helpful to teach children that pronunciation for words "in books" may be different from the way they hear them pronounced in their home and neighborhood. It is important to learn about "book" sounds because this will be very helpful in spelling. Children who come to school speaking a very different dialect than the one in which instruction is offered frequently experience difficulties learning to read. One of the reasons for this is that they have difficulty relating the sounds in their oral language to the way words are represented in print. Since it is critical for all children to acquire phonemic reading skills early in development, teachers must work especially hard with these children in order to insure that they make the connection between the sounds in words and spellings in print.

Materials Teachers Can Use to Help Children Acquire Phonological Awareness

In the remainder of this manual, we will describe several different kinds of curriculum materials that teachers can use to stimulate phonological awareness in individuals ranging in age from kindergarten to adulthood. Most of the materials are designed for very young children, since this is the most appropriate time to offer this type of instruction. However, for individuals who continue to struggle in this area, perhaps because of a severe deficiency of "phonological talent," there are intensive programs designed to help them acquire phonological awareness. The programs we will discuss fall roughly into two categories: those designed for regular classroom instruction in either whole class or small group settings, and those designed for more intensive and explicit instruction for children who do not learn enough from programs offered in the regular classroom. At the conclusion of this section, we will briefly review 53 different pieces of computer software offered for pre-reading instruction in the home and school. Our goal here is to assess the value of this software in stimulating phonological awareness and increasing children's readiness to learn to read.

Phonological awareness materials designed for regular classroom instruction include the following:

- *Phonemic Awareness in Young Children. A Classroom Curriculum*
- *Sound Start: Teaching Phonological Awareness in the Classroom*
- *Sounds Abound Instructional Materials and Game*
- *The Phonological Awareness Kit*
- *The Phonological Awareness Companion*
- *Peer Assisted Learning Strategies for Beginning Readers*
- *Daisy Quest and Daisy's Castle* (computer program)
- *Waterford Early Reading Program* (computer program)
- *Read, Write, and Type* (computer program)
- *Earobics* (computer program)

Programs designed for small group or individualized phonological awareness training for children who have difficulty learning with regular classroom programs include the following:

- *Launch into Reading Success through Phonological Awareness Training*
- *Phonological Awareness Training for Reading*
- *Auditory Discrimination in Depth*

Phonemic Awareness in Young Children: A Classroom Curriculum

(Marilyn Jager Adams, Barbara R. Foorman, Ingvar Lundberg, Terry Beeler, 1997)

Kindergarten–Grade 1

This is a complete, organized curriculum in phonological awareness that is appropriate for kindergarten classrooms as well as first graders who are lagging behind their peers in the development of phonological awareness. It was translated from a program developed by Ingvar Lundberg and used in one of the early and most successful studies of phonological awareness training in the research literature. It is essentially a carefully sequenced series of game-like activities that can be used with large or small groups to build phonological awareness in young children. In a typical kindergarten classroom, the program contains enough activities to occupy 15-20 minutes a day for eight months of the school year. It contains an excellent discussion of the concept of phonological awareness and its relation to reading growth and offers many helpful suggestions for teaching techniques in this area.

Cost

$25.95

Ordering

Brookes Publishing
P.O. Box 10624
Baltimore, MD 21285-0624
800-638-3775

Materials Included with Purchase

This program is contained in a single teacher's manual. The manual describes all 51 activities and how to sequence them in instruction. It also contains many lists of words that can be used in the activities Some of the activities require that the teacher supply materials such as pictures, a ball of yarn, or colored paper. None of the materials would be difficult for a typical kindergarten teacher to develop. The manual also includes a number of group-administered phonological awareness tests that can be used to monitor children's progress. Finally, an extensive selection of support materials is also listed that includes a list of rhyming and alliteration books that can be used by parents and teachers to get children thinking about the sounds in words.

Range of Instructional Activities

This program contains a series of activities that are graded in difficulty, along with a recommended sequence for introducing the activities. The goal of all the activities is for the children to have fun while learning to listen for the sounds in words. Following is the recommended sequence of activities in the program.

Listening games—These introductory activities are designed to sharpen children's ability to listen selectively to sounds in their environment.

Rhyming activities—These activities involving listening to rhyming sentences and stories, generating rhymes, and making judgments about rhyming words to introduce the idea of listening for the sounds in words.

Sentences and words—These activities are included to help children begin to learn about listening for the parts within wholes. They help children acquire an awareness that sentences are made of words.

Syllables—Children learn more about listening for the parts within wholes and also about putting parts together to make wholes while they become aware of syllables in words. These activities teach children to count syllables in words and blend syllables together to make words.

Initial and final sounds—These are the first activities that introduce children to the individual sounds in words Depending upon the pace of the class, this stage of instruction might be reached by late October or November. The children first engage a series of activities with first sounds, like comparing first sounds in words, pronouncing the first sounds, or changing the first sounds to make other words, and then do similar activities with last sounds.

Phonemes—These activities will typically take place during the second semester of kindergarten, and involve full analysis and pronunciation of individual sounds in words as well as activities to teach children to blend sounds together to make words. A variety of concrete materials such as blocks, chips, or pieces of paper are used to represent individual sounds in words.

Letters—These activities come toward the end of the year. Children are taught the letters used to represent a small number of consonant and vowel sounds, and then practice using these letters to represent the sounds in words in both reading and spelling activities.

Research Base

This program was first evaluated in a study reported by Lundberg, Frost, and Peterson (1988) that was conducted in Denmark. They showed not only that the children improved significantly in phonological awareness, but also that the children who received the program later became better readers and spellers than those who did not. The English translation of the program was evaluated in a study reported by Barbara Foorman and her associates in Houston, Texas (Forman, Francis, Shaywitz, Shaywitz, & Fletcher, 1996). Using the program with inner-city children in the Houston Public Schools produced significant enhancement of their growth in phonological awareness by the end of the kindergarten year.

General

This is an excellent program and is strongly recommended for use in kindergarten classrooms. It is also recommended for use with weaker students during first grade. It is teacher-friendly in design and well-organized. The activities should be fun for both teachers and children, and there are clear directions on how to deliver the instruction. The only obvious limitation of the program at present is that it does not supply all the materials required to deliver the instruction. However, the extra materials required should be readily available in any kindergarten or first grade classroom.

Sounds Abound: Teaching Phonological Awareness in the Classroom

(Orna Lenchner & Blanche Podhajski, 1997)

Preschool–Grade 1

Sounds Abound, *formerly called* Sound Start, *contains activities to stimulate phonological awareness that are appropriate for preschool through first grade children. It was developed out of experience at the Stern Center for Language and Learning in Williston, Vermont, and grew out of the efforts of Dr. Orna Lenchner and others to help classroom teachers build phonological awareness in their students. It is designed to serve as a regular class curriculum in phonological awareness primarily for the kindergarten year, and contains activities to teach rhyme, syllable, and phoneme awareness. There are two activities at the end of the program that help children practice using letters to represent the first sound in words.*

Cost

$109 for the manual, instructional materials, and video

Ordering

LinguiSystems
3100 4th Avenue
East Moline, IL 61244-0747
800-776-4332
www.linguisystems.com

Materials Included with Purchase

Sound Start includes a spiral-bound teacher's manual that provides a good overview of the concept of phonological awareness and directions for 21 different instructional activities. In addition, it contains a selection of pictures and game boards printed on 8 1/2 by 11 inch card stock. The kit also comes with an excellent videotape that demonstrates many of the activities in the program

Range of Instructional Activities

The curriculum of Sound Start provides instructional practice in developing rhyme, syllable, and phonemic awareness. Following most of the activities, the authors offer special instructional tips, as well as activities to provide extra instruction and practice for children who are having difficulty mastering the skill being taught. The majority of activities in this program involve singing or other musical activity. Following is a list of the specific skills taught in the program.

Rhyme

- Recognition ("Does *log* rhyme with *dog*?")
- Completion (Child completes a rhyme within a sentence, like "Jack and Jill went up the _____?")
- Production—children make up rhymes for individual words ("What words rhyme with *blue*?")

Syllable Awareness

- Segmentation—These activities teach children to count the syllables in words and pronounce the syllables separately.
- Deletion—This uses compound words to give children practice in making new words by dropping one of the parts of the compound word (e.g., *starfish*: *star*, *fish*).

Phonemic Awareness

- Initial sound recognition—These activities require childen to select a picture beginning with a given sound or to pronounce the beginning sound of a word.
- Phoneme segmentation—Children pronounce all the sounds in words—they are supported with pictures that have dots at the bottom showing the number of sounds in the words.
- Phoneme deletion—Children recognize the sound left out when the teacher says their name after deleting the first sound (e.g., *Mark*: ark, the /m/ sound was left out).
- Phoneme substitution—Children practice making funny words by putting different sounds at the beginning of words.
- Phoneme blending—Children practice recognizing pictures or body parts when their names are pronounced one phoneme at a time (e.g., /n/-/o/-/z/, /f/-/oo/-/t/)

Activities with Letters

Matching letters to first sounds in words—Two activities are included that provide practice in identifying the letter that stands for the first sound in a word. The children are either given the word and must identify its first letter or are given the letter and must identify a picture that goes with it.

Research Base

This program has not been evaluated in research. However, almost all of the activities are very similar to those of other programs that have been evaluated and have produced significant growth in phonological awareness The primary question about the effectiveness of this program is whether it contains enough different activities to support instruction across an entire classroom year and, thus, whether it will be as effective as those programs that include a greater variety of content and activities.

General

One strength of this program is the demonstration video that is included with the materials. It provides delightful examples of many of the activities being performed by the author with a small group of children. This video should be very useful for inservice training of teachers and for showing to parents as part of parent programs. One possible limitation of the program is the relatively limited number (21) of different activities it contains. However, the manual does provide suggestions for additional activities so teachers should be able to generate more practice if the children in their classes seem to require it Finally, the program contains only two very simple activities designed to help children see the connections between sounds and letters. The program will need to be supplemented with other activities at the end to ensure that children learn to apply their newly acquired phonemic awareness to spelling and reading print.

Sounds Abound

(Hugh Catts and Tina Olsen, 1993)

Kindergarten—Grade 1

This popular program has been in use in kindergarten and first grade classrooms for a number of years. The spiral-bound book contains both activities and materials to lead children from beginning rhyming activities through activities involving letters and sounds. It is written in a very simple format, and the activities are easy to implement and described concisely in the manual. It is not presented as an organized curriculum, but the order of activities presented in the manual does move gradually from easier to more difficult.

Cost

$37.95 for the manual

A game to support many of the skills taught in the *Sounds Abound* program can also be ordered from LinguiSystems. It provides an interesting game board and directions and materials to reinforce skills in rhyming, sound comparison, sound blending, and phoneme segmentation. We would recommend that the game be purchased along with the manual for maximum effectiveness and ability to provide extra practice for those children who need it The game could also be purchased separately for use in support of any of the phonological awareness programs discussed in this manual. Price $39.95.

Ordering

LinguiSystems
3100 4th Avenue
East Moline, IL 61244-0747
800-776-4332
www.linguisystems.com

Materials Included with Purchase

The *Sounds Abound* program is contained in a spiral-bound notebook. The notebook contains both directions for the activities and many pictures used with the activities. In addition, it contains a list of picture books that emphasize rhyme, song books, and fingerplay and rhyme books that can be used to build sound awareness in young children. The manual also contains some simple tests of phonemic awareness that can be used to assess growth of these skills before and after the program is implemented.

Range of Instructional Activities

The activities in *Sounds Abound* focus on four broad areas.

Rhyme

- Activities to teach children how to judge whether words rhyme or not
- Activities that help children learn to generate rhyming words

Beginning and Ending Sounds

- Activities that teach children to make judgments about whether words begin or end with the same sound
- Activities that teach children to produce words beginning with the same sound as another word

Segmenting and Blending

- Activities that teach children to segment words into syllables
- Activities involving blending of syllables into words
- Activities that lead children to segment and pronounce the phonemes in words
- Activities that involve blending individual phonemes into words

Putting Sounds Together with Letters

These activities teach children the sounds associated with seven consonants and five vowels and then provide structured activities in which children learn to make different words by changing the first letter (e.g., with _*a t* already given, the children can make *sat*, *fat*, *mat*, *pat*, and *rat* by choosing different letters)

Research Base

As with most of the programs described here, there is no specific research support for the *Sounds Abound* program as a unique instructional sequence. However, all of the activities were taken directly from research projects that did show a significant impact on the growth of phonological awareness in young children.

General

This is an excellent set of materials for guiding phonemic awareness instruction in kindergarten or first grade. Its primary strengths are the simplicity of layout and the ease with which the activities can be executed in the classroom. It may require a bit more creativity on the part of the teacher to maintain interest than a program like *Sound Start*, since there is not an elaborate game or activity structure developed for each of the instructional activities. *Sounds Abound* would be a useful addition to any kindergarten program in phonological awareness and could be used by paraprofessionals or parent volunteers to strengthen phonological awareness in small groups of children.

The Phonological Awareness Kit, Primary and Intermediate

(Carolyn Robertson & Wanda Salter, 1995, 1997)

Kindergarten–Grade 2; Grades 3–8

The Phonological Awareness Kit *is a program of instruction in phonological awareness that comes in two versions. The primary kit is designed for small group or whole classroom instruction with children in kindergarten through 2nd grade, while the intermediate kit is appropriate for individual or small group instruction with 3rd through 8th grade children who are having difficulties acquiring phonemic awareness and phonetic reading skills. Both programs contain instructional activities and supporting materials that can be used to provide a comprehensive program of instruction in phonemic awareness that begins with oral language activities and ends with letter-sound and phonetic reading and spelling activities.*

Cost

$69.95 for each kit, which includes a manual and all supportive material

Ordering

LinguiSystems
3100 4th Avenue
East Moline, IL 61244-0747
800-776-4332
www.linguisystems.com

Materials Included with Purchase

Both kits include a spiral-bound teacher's manual and supporting materials such as colored plastic blocks, picture cards, tokens, and letter tiles. The manual for the beginning program contains instructions for 31 activities, while the intermediate manual includes 25 Many of the activities in the intermediate program are more complex than those in the beginning manual because they are designed to be used with older children. Both manuals contain many excellent word lists that can be used in support of the activities.

Range of Instructional Activities

Both the beginning and intermediate kits contain a range of instructional activities appropriate to their intended age groups. The activities in this program are not embedded in as game-like a format as is the case with some of the other programs, but they are intended to be fun and could easily be adapted for use within games. The activities in each kit are described below:

Beginning Level Kit

- Activities involving rhyme recognition and production
- Segmenting sentences into words and compound words into root words
- Counting the syllables in words
- Many different activities involving isolation, segmentation, blending, deletion, and substitution of phonemes in words
- Activities involving letter sounds and beginning reading and spelling

Intermediate Level Kit

- Many activities involving isolating, counting, and deletion of syllables in words

- Activities involving the isolation, blending, segmenting, deletion, and substitution of phonemes in words
- Activities with letters that involve learning all the letter sounds, initial and final blends, consonant digraphs, vowel dipthongs, and some simple phonics rules (silent e, r-controlled vowels) These activities involve children extensively in reading and writing simple words and sentences.

Research Base

As with most of the programs described here, there is no published research support for the *Phonological Awareness Kits* as a set of specific activities with a unique instructional sequence. However, all of the activities follow principles and contain content that have been demonstrated in research to produce a significant impact on the growth of phonological awareness in young children.

General

Both the beginning and intermediate kits are well-designed, with high quality materials that can be used to support excellent instruction in this area. The beginning kit can be adapted for whole classroom instruction, although many of the pictures may not be large enough to use with whole classrooms. A strength of both kits is the extent to which they continue phonemic awareness activities into exercises involving print. The intermediate kit, in particular, is strong in this area and actually provides for a range of activities that would be similar to many beginning phonics programs. Both kits contain excellent word lists that can be used to provide in-depth practice on the skills taught in the programs.

Peer Assisted Learning Strategies for Beginning Readers

(Patricia Mathes, Jill Howard, Joseph Torgesen, & Barbara Edwards, 1997)

Kindergarten—Grade 1

Peer Assisted Learning Strategies for Beginning Readers (PALS) *is a program to stimulate phonological awareness and build beginning reading skills. Its development has been, and continues to be, supported by grants from the U.S. Office of Education It is based on extensive research using older children as peer tutors, and it has adapted many of the principles learned in that work for use with younger children.*

There is one program available for kindergarteners and another targeted to first graders. Programs for children in grades 2–12 are also available that pair same-age children in a classroom. The programs are for use in 30-minute sessions between two and four times per week. These programs complete, but do not replace, existing curricula. The programs for older children are used in conjunction with basal readers, library books, etc.

Cost

$30 for the manual, which includes all lesson materials to operate the program; $10 for a videotape demonstrating use of the lessons

Ordering

Peabody College, Box 328
Vanderbilt University
Nashville, TN 37203
615-343-4782
www.vanderbilt.edu/kennedy/pals

Materials Included with Purchase

All the materials necessary for implementing this program are included in a loose-leaf binder. These materials include highly scripted lessons that teachers can use to teach children the tutoring procedures, instructions on details of program management (e.g., scheduling students, how to handle absenteeism), materials like score boards that are helpful in program management, and 57 student lesson sheets. The manual is very readable and is laid out in a logical and easy to understand manner.

Range of Instructional Activities

The lesson manual provides procedures for two kinds of activities: Sounds and Words and Story Sharing. The latter type of activity is designed to support reading comprehension and will not be discussed here because that is not the focus of this manual The Sounds and Words activity focuses on five essential phonological skills:

- Identify letter-sound correspondences automatically
- Understand that words are constructed of individual sounds
- Blend sounds together to sound out words
- Recognize sight words
- Integrate phonological knowledge into the act of reading

In the current version for first- and second-grade students, this program allows children to practice oral language phonemic awareness activities at the same time they are learning about print. The major phonemic awareness activity in the program asks children to "say words slowly" while they show the number of sounds with their fingers. During the preparation lessons which are led by the teacher and done with the whole class, children also play the "first sound" game in which they

are asked to say the first sound of a word. Once the peer tutoring sessions begin, the children only do the "say it slowly" activity. The other activity that directly builds phonemic awareness while involving print is the "sound it out" activity. Here, students first slowly identify the sounds in a printed word, and then "say it fast" to blend the sounds together. Over the 57 lessons students are given experience with almost all of the consonant phonemes, all the short and long vowels, and several vowel digraphs

Research Base

The PALS activities have been evaluated positively in several research studies. In the first study, conducted in Nashville, Tennessee, both children who were at the middle and bottom range of reading skills at the beginning of the year showed substantially greater gains in phonemic awareness and reading skills than children who did not receive the program (Mathes, Howard, Allen, & Fuchs, in press). Essentially the same results have been achieved in two other studies conducted in Florida (Mathes & Osterloh, 1997; Mathes, Howard, Torgesen, and Edwards, 1997). Thus, the same results about the effectiveness of the PALS program have been obtained in three separate studies using different samples of children.

General

PALS is an excellent program to use in first and second grade to increase the amount of practice children receive in building phonological awareness and phonetic reading skills. It is relatively easy for teachers to learn to implement, and it provides productive activities for both low- and high-ability children to do together. High-ability children are paired with lower-ability children, and both children receive opportunities to serve as the "coach" as the skills are being learned. Effective use of PALS requires good classroom control. If a classroom contains a relatively high proportion of children who experience difficulties following classroom rules or interacting successfully with their peers, the program will be difficult to implement effectively. The basic format of the lessons, as well as the order in which new knowledge is introduced, follow well-established principles from Direct Instruction (Carnine, Silbert, & Kameenui, 1997). Ease of monitoring growth in the program will be facilitated as soon as the computer based assessment procedures are developed.

Daisy Quest and Daisy's Castle

(Erickson, Foster, Foster, & Torgesen, 1992, 1993)

Kindergarten–Grade 1; Special Education

Daisy Quest and Daisy's Castle *are two computer programs designed to stimulate phonemic awareness in young children. They were developed with support of a grant from the National Institute of Child Health and Human Development. Although their primary use will be with kindergarten and first grade children, many teachers have reported using them successfully with older children receiving special education. The programs will run on almost any Macintosh computer, but they will not run in Windows or DOS. The programs use very high-quality graphics, digitized speech, an interesting story line, and animation to hold children's interest.*

Cost

$59 for both

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc.com

Materials Included with Purchase

The programs come on several 3.5-inch disks, and they include a teacher's manual that provides complete instructions on how to use them. The programs come with management software that allows the teacher to specify the activities that will be available for any given child and also will provide a report of the level of performance for each child. The program keeps track of the activities that have been successfully accomplished and encourages children to try new activities so that they can keep moving forward.

Range of Instructional Activities

Daisy Quest provides instruction and practice in four phonological awareness activities; *Daisy's Castle* provides three additional activities. Each activity contains an instructional/practice module in which children are taught how to perform the activity and allowed to practice as much as they want, and it also contains two different testing modules that allow children to show what they have learned. The simplest testing module simply asks whether two words rhyme (or begin with the same first, middle, or last sound), and the second testing module requires the child to indicate which of three words rhymes (or has the same first, last, or middle sound) as a target word. As children complete different activities at a preset criterion of performance, they are rewarded with clues about the location where Daisy the Dragon is hiding in the world they move through in the program.

The activities included in *Daisy Quest* are as follows:

- Rhyming—Children are taught to indicate whether or not two words rhyme.
- First sound comparison—Children learn to compare words on the basis of their first sound.

- Last sound comparison—Children compare words on the basis of last sounds.
- Middle sound comparisons—Children learn to compare words on the basis of their middle sounds.

Daisy's Castle contains three instructional activities.

- Onset-rime blending—Children learn two-part blending involving onsets and rhymes (c-at, d-og).
- Full blending—Children blend all the sounds in two-, three-, and four-phoneme words to identify a specific word.
- Counting sounds—Children indicate how many different sounds they hear in two-, three-, and four-phoneme words.

Research Base

These computer programs have been evaluated in two studies. In the first study (Foster, Erickson, Foster, Brinkman, & Torgesen, 1994), a total of 46 children ranging in age from 57 to 93 months were given approximately five hours of experience with *Daisy Quest*. The children showed approximately as much improvement in phonological awareness as many teacher-led programs produce in an average of about nine hours of instruction (Torgesen & Barker, 1995). Another study evaluated the use of both programs with a group of children who were experiencing reading problems after four months of instruction in first grade (Barker & Torgesen, 1995). The children received approximately eight hours of instruction with both programs, and gained substantially more in phonological awareness and word-reading ability than similar children who had been given experience with software to increase early reading skills or build mathematics skills.

General

These programs, when used together, can be very helpful in providing instructional and practice activities that will stimulate phonemic awareness in young children. They can be used either as stand-alone activities or, preferably, as a way of providing additional experience in the context of a classroom-wide curriculum in phonological awareness. By themselves, they will probably not be sufficient to help children with severe phonological disabilities acquire useful levels of phonemic awareness. Young children with extremely low ability may require the assistance of either an older child or an instructional aide as they are introduced to different activities in the programs, since the instructional routines of these programs are not robust enough to deal with all of the learning difficulties that are present in children with phonological disabilities. (This is less true for older children with reading disabilities.)

Waterford Early Reading Program

(Waterford Institute, 1993 and later)

Kindergarten–Grade 2

The Waterford Early Reading Program *provides a rich set of instructional and practice experiences focused on pre-reading knowledge and skills. It took 10 years and $25 million to develop, and its development has been supported through grants from a variety of foundations. It represents an attempt to use computers to teach all the major skills and knowledge involved in learning to read. The instruction takes advantage of the full multimedia capabilities of our most advanced personal computers and includes original songs, art work, full motion video, and animation. The activities have been designed to capture and hold the attention of young children. Each level provides approximately 15-20 minutes of daily instruction to extend over the entire school year. Materials for children to keep, including books, videotapes, and audiotapes, are also included.*

Level One—Reading Readiness and Emergent Skills

Level Two—Beginning Reading

Level Three—Fluent Reading

Cost

Cost varies with the components ordered. A full classroom installation including the necessary computers, all software, and supportive teacher and child materials costs more than $20,000 at present.

Ordering

Electronic Education
888-977-7900
www.electroniceducation.com

Materials Included with Purchase

The *Waterford Early Reading Program* is by far the most expensive instructional package described in this manual. It is sold in "units" that support instruction for an entire classroom, and each unit typically includes three very high-end multimedia computers, teacher manuals that describe supportive classroom activities, and materials, including 40 individual readers, and four videotapes, for each child to take home.

Range of Instructional Activities

The instructional objectives of the Level 1 curriculum fall into six categories. These categories are listed and described below:

- Print awareness—Activities within this objective include such things as learning letter names and sounds, understanding direction of print, and writing and forming letters and words.
- Phonological skills—This is the component directly focused on phonological awareness. Children receive extensive experience with rhyme; matching words on first, middle, and last sounds; phoneme blending; and counting the sounds in words.
- Visual perception—This segment teaches children to recognize shapes, patterns, and details in visual material.
- Listening skills—These activities help children to hone their listening skills with music and aurally presented stories.
- Concept development—This component focuses on such things as learning about numbers, opposites, and story sequence; making predictions in stories; and distinguishing between real and make-believe.
- Computer skills—Children learn to use a mouse and practice beginning keyboard skills.

The activities in each component are varied from day to day and build in a sequence from simpler to more difficult activities. The program keeps track of children's progress and automatically provides the instruction their development warrants.

Research Base

The Level 1 curriculum has been evaluated at numerous sites around the country, ranging from large urban schools to suburban schools to rural schools. The addition of the computer experiences to the standard kindergarten curriculum has consistently produced large gains in pre-reading skills at the end of the year. Measures have included tests of phonological awareness, letter knowledge, and concepts about print. The major unknown at present about this curriculum is whether it will prove to be more effective than less costly teacher-led interventions. No studies are currently available to indicate that it will produce larger gains in pre-reading skills than might be obtained through teacher training in a kindergarten curriculum focusing on the same skills. However, this may not be the crucial question. The *Waterford Early Reading Program* is a standard curriculum that will remain in place even if trained teachers move away from a school or if district policies about teacher training and support change. The most important question is really whether a high-quality, computer-based curriculum will provide more long-term stability for appropriate and effective instruction than will the less costly materials that depend on teacher training and support to implement effectively.

General

The *Waterford Early Reading Program* is almost certainly the most comprehensive, highest quality computer-based curriculum in essential pre-reading skills currently available. Evidence suggests that it is effective in teaching phonological awareness and other important skills necessary to early reading growth. It does not require extensive teacher training to implement, although its overall effectiveness might be significantly enhanced if teachers were more carefully trained to use the supplemental materials provided within the program.

Read, Write & Type! Learning System

(Jeannine Herron, 1995)

Grade 1

Read, Write & Type! Learning System *is a software-based program designed to teach children to read through writing. It is included in this manual because it contains many activities that are explicitly designed to build phonemic awareness, and initial research suggests that it can be used effectively to help children with phonological weaknesses acquire beginning reading skills. It uses the full multimedia capabilities of modern computers to provide very engaging instructional and practice activities for young children. It can be used with whole classroom groups to teach typing and writing skills, or it can be used more intensively with at-risk children to teach these same skills plus reading. The set includes two CDs*—Read, Write & Type *and* Spaceship Challenge.

Cost

$99 for teacher's manual, two copies of each CD, 18 reading booklets, practice keyboard

$155 for five-station lab pack

$399 for five-station lab pack and all assessment and classroom activities for one class of 25 students

$1,200 for 25-node school-site license and materials

Ordering

Talking Fingers
One St. Vincent Dr.
San Rafael, CA 94903
www.readwritetype.com

Materials Included with Purchase

The *Read, Write, and Type* program can be ordered in at least two versions. The version for teachers includes the program on a CD-ROM plus a teacher's manual that describes a variety of learning activities to be used prior to introduction to the same content on the computer. These teacher-led activities are designed to help make the computer-based learning/practice experience more successful for young children. The manual also contains many pictures and word lists that can be copied and used in teacher-led instructional activities. The home version of the program does not include the instructional manual.

Range of Instructional Activities

Read, Write and Type contains 40 lessons, each of which is designed to introduce a new phoneme and provide practice hearing it in words, as well as typing it by itself, and in words and stories. One of the major instructional goals of this program is to provide children with the skills necessary to type any regularly spelled word they hear. It brings meaning to this task by engaging children in writing and reading tasks at the sentence and story level. Within the context of this program, children primarily read material they themselves have typed. Thus, it is not a stand-alone reading program but rather is designed to provide a meaningful context for teaching phonemic awareness and phonetic writing and reading skills. A few simple phonics rules, such as the signal e (makes the middle vowel say its name) are taught in the teacher-led lessons accompanying the program

Each lesson provides the following experiences with each of the 40 phonemes and letter-sound correspondences taught by the program:

Initial instruction in how to type the sound—This includes direct instruction and modeling by animated "hands" as well as practice typing the phoneme in words and short phrases.

Phonemic awareness—This activity provides practice in "listening" for the sound within words The child is shown a picture and must indicate whether the given phoneme occurs at the beginning, middle, or end of the word.

Practicing the phoneme in the context of a story—This activity requires the child to type a simple story dictated by the computer and made up of words and phonemes the child should know. There is substantial visual support and prompting to help children with this task.

In addition to these standard activities for each phoneme, there are areas in the program that encourage the improvement of fluency in typing and creative writing in the form of e-mail messages. The program monitors child progress and provides certificates for the completion of each level of instruction.

Research Base

The *Read, Write, and Type* program has been evaluated in both whole classroom and small-group instructional applications. With whole classroom groups, it is typically used for 45 minutes a day, with part of that time being teacher-led instruction. Initial reports (Herron, 1997) of this use of the program are encouraging, with most children in first and second grades being able to acquire useful typing skills and improve their ability to spell and apply phonetic reading skills during reading. In an ongoing study in Tallahassee (Torgesen, Rashotte, & Wagner, 1997), the program has been used with small groups (three children) of at-risk children in four 50-minute sessions a week for eight months of the school year Although these children began the year with reading skills substantially below their peers, their scores on phonetic reading ability, sight-word reading, and passage comprehension were all average to slightly above average at the end of the year. We also found that almost all the children could learn useful typing skills from the program. The first year's instruction is now being replicated with another group of children.

General

This is a very well-designed and executed program. The graphics and sound are very engaging for young children. They enjoy working on the program for extended periods of time The instructions and activities in the teacher's manual are also instructionally sound and fun for both teachers and children. The program is not recommended as a stand-alone experience for at-risk children, but with teacher support, it appears to be a very effective way to prevent reading problems in at-risk children in first grade. For children with more normal learning abilities in reading, it would provide a very helpful additional experience to stimulate writing skills and help them learn to type.

Earobics Literacy Launch

(Jan Wasowicz, 1997)

Kindergarten–Grade 2/ Adolescents & Adults

Earobics Literacy Launch *is computer software designed specifically to build listening skills and phonemic awareness in young children ages four to seven. It offers a comprehensive range of activities to stimulate phonological awareness, and these activities can be engaged at many different difficulty levels (as many as 114) ranging from simple listening skills to work with letters and sounds. The quality of the graphics and program structure are very high and should be consistently engaging for young children. The program should also be suitable for stimulating phonological awareness in older children who are experiencing delays in phonological development The instructions for the children are available in 10 languages.*

Step 1—Prekindergarten/Kindergarten

Step 2—First and Second Grade

There is also a version of Earobics 1 for adolescents and adults.

Cost

$59 each for the home version of each level

Request pricing for professional version

Ordering

Cognitive Concepts
207 Hamilton Street
Evanston, IL 60202
847-328-8199
www.cogcon.com

Materials Included with Purchase

Earobics can be purchased in two versions. The home and professional versions are the same except that the latter makes provision for as many as 25 children to register, while the home version allows only two children to register at a time. In addition, the professional version contains more extensive data collection and report writing features than the home version. Both versions come on a CD-Rom that can be played in either MacIntosh or Windows environments. A small instruction booklet accompanies the CD.

Range of Instructional Activities

All the activities in this program employ an adaptive practice format in which the level of difficulty of the items is adjusted according to the performance of the child. The level of difficulty of the games is increased if the child meets a given performance criterion, and it is lowered if the items are too difficult. The goal is to allow the child to progress through items that gradually increase in difficulty until high levels of performance are obtained. Both versions of the program keep records that allow the child to resume play at the level of difficulty that was achieved in the previous session. There are six activities, each embedded in a different game-like format The activities can be played in any order selected by the child, or the child can focus on only a few of the activities at a time. The activities are described below:

Karloon's Balloons—This activity strengthens listening skills by requiring the child to remember sequences of sound effects, words, numbers, or speech sounds. The computer provides an auditory sequence, and the child must then click on pictures associated with the sounds in the right order. There are 38 levels of play for this activity

C.C. Coal Car—This activity teaches letter-sound correspondence and phonemic awareness. Across 74 levels of play, the child begins by simply indicating whether a given phoneme matches a letter, and ends with levels that require the child to indicate where a given sound occurs within a three phoneme word.

Rap-A-Tap-Tap—This activity teaches phonemic segmentation across 16 levels of play. The child begins by simply counting the number of separate drum beats there are in a given sequence, and it ends with items that involve counting the number of syllables or phonemes in words.

Caterpillar Connection—This is a phoneme-blending activity that begins with blending compound words and ends with blending phonemes There are 56 levels of play

Rhyme Time—This activity, which contains 11 levels of play, teaches children to identify words that rhyme.

Basket Full of Eggs—This activity begins by helping children learn to hear the differences between vowels and between consonant-vowel combinations. The computer pronounces two vowels or combinations, and the child simply indicates if they are the same or different. When the child is working with consonant-vowel combinations, the early levels of difficulty acoustically enhance the distinctiveness of the combinations; this distinctiveness is gradually reduced as the child moves through the program There are 114 levels of play in this activity.

Research Base

We are not aware of any published research that documents the effectiveness of this program. However, the activities themselves, and the levels of difficulty for each activity, are consistent with principles of effective instruction in phonemic awareness. If this program is used consistently with young children, it should have very similar effects as other instructional programs that follow the same principles. Given the large range of difficulty of the items in *Earobics*, the program appears to have special potential to enhance phonemic awareness in children with phonological processing difficulties.

General

Earobics has a number of important strengths which recommend its use both at home and in the schools. The activities in the program follow principles of good instruction in phonemic awareness, and they are provided at many levels of difficulty to support gradual growth and extra practice for children who have difficulty in this area. The most obvious limitation of the program is that the format of feedback, and of the games themselves, may become repetitious for children who spend a lot of time with the program. For children who have difficulty learning in this area, teachers and parents may have to structure additional rewards for progress through increasingly challenging levels of the program. The program would provide excellent supplemental instruction to kindergarten and first-grade children who are receiving classroom instruction in phonemic awareness but are having difficulty keeping up with their peers.

Launch into Reading Success through Phonological Awareness Training

(Lorna Bennett & Pamela Ottley, 1996)

Kindergarten–Grade 1

This program was designed to provide special support in the development of phonological awareness to kindergarten children who are at risk for reading failure. Most of the activities are designed for small-group, rather than whole-classroom, instruction. The program contains 66 activity lessons that should take anywhere from 10 to 30 minutes each to complete. Because it is highly scripted, Launch into Reading Success *can be led by paraprofessionals or parent volunteers, as long as it is done under supervision of the classroom teacher.*

Cost

$79 for the manual, pictures, and game boards

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc.com

Materials Included with Purchase

This program is packaged in a three-ring binder that contains the manual as well as all of the word lists and pictures to be used in the activities. Also included are two laminated game boards used in several of the activities Some additional materials are required for some of the activities, but these should be readily available in any kindergarten or first-grade classroom.

Range of Instructional Activities

The instructional activities for *Launch into Reading Success* are grouped within eight broad objectives. Each objective contains several instructional activities that build upon one another to achieve the desired learning outcome The eight objectives of the program are as follows:

- Awareness of whole words as sounds—These activities focus on helping the child identify words as individual sound segments within sentences.
- Tapping—The objective here is to lead children to be able to tap out the number of syllables in words containing from one to four syllables.
- Rhyme—This objective contains 8 activities designed to lead from being able to recognize if two words rhyme to being able to generate rhyming words
- Onset and rime—These 5 activities are designed to show how words can be broken into onset and rime segments (c-at, b-ig) and how these segments can be blended together to form words.
- Segmentation—This section begins with activities to teach children how to segment words into syllables by pronouncing each syllable separately. They then learn to segment two- and three-phoneme words and pronounce the individual phonemes separately.
- Discrimination—This extensive section (11 activities) develops the skill of identifying words that begin and end with the same sounds.

- Pronunciation lessons for consonant pairs—This unique section (it is more developed here than in most training programs) provides instruction designed to show children the essential differences between voiced and unvoiced consonants (e.g., p – b, d – t, ch – j), and also to point out the way each of the consonant sounds are formed in the mouth.
- Blending phonemes—These five activities build skill in blending separately presented phonemes together to form words.
- Linkage—These 14 activities begin by teaching children to recognize the letters *a, p, t, m,* and *i,* and to associate the appropriate phonemes with them. Subsequent activities show children how these letters represent sounds in words. Most of these activities involve changing the first sounds in words by changing the letters.

Research Base

This program has not been directly evaluated in research. However, the activities it uses are very similar to those contained in programs that have been shown to be effective in increasing phonological awareness. Given our experience with similar programs, we would expect the kinds of activities used in this program to effectively teach phonemic awareness to children with the most severe phonological weaknesses.

General

This program has a number of strengths that recommend it for use with at-risk children. First, it begins at a very basic level and moves through the steps of acquiring phonemic awareness in relatively small steps. Second, it places a strong emphasis on showing children how the sounds in words are represented in print. This may be particularly important for children who have lower ability in the phonological area. Finally, the program provides extensive practice in learning the distinct articulatory and acoustic features of individual consonant phonemes, which should help children to recognize phonemes when they occur at different positions within words. The major limitation of the program arises from the fact that it may not be sufficiently powerful to help the 3 to 5 percent of children with the most severe phonological disabilities acquire sufficient phonological awareness to learn beginning phonetic reading skills. It also is not clear why children are taught to segment and pronounce the individual phonemes in words before they are taught how to compare words on the basis of their first and last phonemes. This latter skill is easier than full segmentation and is taught prior to segmentation in most programs.

Phonological Awareness Training for Reading

(Joseph Torgesen & Bryan Bryant, 1994)

Kindergarten–Grade 2

The Phonological Awareness Training for Reading *program was developed with the support of a grant from the National Institute for Child Health and Human Development. It was designed to provide small-group instruction for children with weaknesses in the area of phonological awareness. It is highly scripted so that it can be followed by teachers without special training. If it is used in 30-minute sessions three times a week, it can be completed in slightly less than one semester of instruction.*

Cost

$139 for the kit

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc.com

Materials Included with Purchase

Materials in the program kit include an instructors manual, two game boards, a large picture of Rocky the Robot that is used during sound-blending activities, six sets of laminated picture cards, a set of letter cards, several solid color cards for use in phoneme-counting activities, colored game tokens, and an audiotape that illustrates how to pronounce phonemes in isolation All materials necessary for instruction are included in the kit.

Range of Instructional Activities

The phonological awareness skills in this program are taught and practiced using a sequence of wordsets. This structure was used so that children could become very familiar with a small set of sounds by working within wordsets that contained a restricted number of phonemes. Each new wordset introduces three new consonant phonemes, for which mouth and tongue positions are explicitly taught. This was designed to make the awareness tasks easier. As the same activities are practiced across different wordsets, children's awareness skills should become more generalized.

After several sessions of "warm-up" activities involving rhyme, the following skills are taught with each wordset:

Set 1	Onset/rime blending Phoneme blending Segmentation of initial phoneme
Sets 2-5	Phoneme blending Matching words on basis of first, last, and middle sounds Identifying the position of phonemes within words Pronouncing the first, last, and middle sounds in words

Sets 6-8

Instruction in letter/sound correspondences
Making new words by changing the first, last, or middle letter
Blending words when letters stand for the phonemes

Research Base

Two studies have been reported that validate the effectiveness of the *Phonological Awareness Training for Reading* program. In a study reported by Torgesen, Morgan, & Davis (1992) it was shown that both the segmenting and blending activities included in the program were necessary in order to support growth in the ability to read new words. The second study (Torgesen & Davis, 1997) showed that the program produced a very sizeable average effect on the phonological awareness of a large group of highly at-risk children. Overall, the skills of this group of children who began below the 10th percentile moved up very close to average for both segmenting and blending after about 16 hours of training with the program. Even though the overall training effect from this program was very strong, about 15-20 percent of the at-risk children showed very little growth in phonological skills from their experience with the program. These children may have required either more highly trained teachers or more intensive instruction than was provided in this study.

General

This program is well-suited for children with mild to moderate phonological awareness difficulties. It provides in-depth practice on critical phonological awareness skills, and it is paced for children with learning difficulties in this area. It is relatively easy to use and requires no special training, although teachers with special training in reading or language will find it initially easier to use than those who do not have such training. Although the program was designed to help children in the second semester of kindergarten prepare for reading instruction in first grade, it can appropriately be used with children who are experiencing difficulty in reading as late as the second grade.

LIPS: The Lindamood Phoneme Sequencing Program for Reading, Spelling, and Speech

(Patricia and Phyllis Lindamood, 1998)

Birth—Adult

LiPS replaces Auditory Discrimination in Depth (1984) by Patricia and Charles Lindamood. This multisensory program is designed to stimulate phonemic awareness and to teach phonemic reading skills to children with moderate to severe phonological disabilities. Its unique feature is that it helps children discover the articulatory and motor features of phonemes and track sounds within speech. It has been used for many years in clinical settings with people with severe reading disabilities, but may also be appropriate for preventive instruction with children at-risk for reading disabilities. LiPS is complex; extensive teacher training is required.

Cost

$498 for the classroom kit

There is now available through Lindamood-Bell Learning Processes (LBLP) a CD-ROM that contains an extensive set of practice activities in support of this program. It is designed as practice for students currently receiving instruction in the LiPS program We do not recommend that teachers simply buy the kit and begin to use it without this training.

Ordering

PRO-ED Publishing
8700 Shoal Creek Blvd.
Austin, TX 78757-6897
800-897-3202
www.proedinc.com

Materials Included with Purchase

The LiPS complete classroom version includes the trainer's manual; research booklet; audiocassette; videotape; and a variety of instructional support materials, including letter tiles, mouth-form pictures and cards, colored blocks, and colored felt squares. The manual contains extensive descriptions of instructional procedures, as well as a complete discussion of the instructional philosophy and goals of the program.

Range of Instructional Activities

The LiPS program contains instructional activities extending all the way into fully developed phonics instruction and strategies for reading and spelling multisyllable words. Since the focus of this manual is on phonological awareness, our description will focus primarily on that aspect of the program.

The initial instructional activities of the program are designed to help children become aware of the specific mouth movements associated with each phoneme in the English language. The emphasis in the LiPS program is on the discovery method of learning. That is, the mouth movements associated with each phoneme are not directly taught by the teacher. Rather, the child is helped to discover this information by the teacher, whose role is to ask carefully focused questions that guide the discovery process. Once children become aware of the mouth movements required to make a given phoneme, they learn labels for each phoneme that are descriptive of place and manner of articulation (e.g., "lip popper" or "tip tapper"), and they learn to associate each sound with a picture showing a mouth making the sound (mouth-form pictures). Children work initially with a small group of consonant and vowel sounds, and once they have learned the labels and mouth/form pictures associated

with these sounds and can explain the meaning of the labels, they engage in an extensive series of problem-solving exercises that involve representing sequences of phonemes with either mouth-form pictures or colored blocks. This training is designed to help them focus on mouth movements in order to feel the identity, number, and sequence of sounds in syllables, and it also enables them to learn to represent these sequences with concrete visual objects.

As children learn to label each phoneme with a descriptive name, they are also taught to associate specific letters with each phoneme. So, once children become facile at representing sequences of sound with concrete objects, it is a natural transition to begin to represent them with letters. Children learn first to encode (spell) syllables with letters and then learn to decode (read) syllables by blending the separate phonemes together. Much of this beginning work with spelling and decoding simple patterns (CV, VC, CVC combinations) includes the use of nonwords in order to reinforce the habit of feeling and hearing the individual sounds in words.

Research Base

According to the research review included in the LiPS package, there have been few published reports of tightly controlled research studies of the LiPS program itself. However, a number of recent studies have been reported that support the utility of the program in teaching beginning reading skills to children with phonological disabilities. Several studies (for example, (Alexander, Anderson, Heilman, Voeller, & Torgesen, 1991; Torgesen, Wagner, Rashotte, Alexander, & Conway, 1997) have demonstrated that the program is very effective in increasing both the phonological awareness and phonemic reading skills of older children with severe reading disabilities. There is also good evidence that the program can be used successfully with very young children identified as highly at-risk for reading failure if it is offered during the initial stages of learning to read (Torgesen, Wagner, & Rashotte, 1997)

General

This is an excellent and comprehensive program for use with children who have severe difficulties acquiring phonological awareness and learning phonemic reading skills. For older children with severe reading disabilities, the typical length of treatment is about 80 hours of individual instruction, but it can sometimes range up to 160 hours. The primary limitation of the program is that it requires thorough, specialized teacher training in order to obtain beginning-level skills in its use.

Software to Build Pre-Reading Skills

This section provides a brief description of software that is currently being mass marketed to provide instruction and practice in a variety of pre-reading skills. These programs are primarily intended for home use but are also being used in many kindergarten and first-grade classrooms. We initially reviewed this material to determine which programs contained activities explicitly designed to stimulate phonological awareness. Very few programs contained such activities, although a number of them did provide experiences with rhyme and alliteration (listening for the first sounds of words). Most of the programs contain simple phonics activities that require some knowledge of letter/sound correspondences. However, many of the activities involving letters should reinforce and build on a child's current level of phonemic awareness. We deliberately did not review software that is marketed to teach phonics skills once children begin to learn to read. Although there is a substantial amount of such software, we felt that it was beyond the scope of our purposes to consider it in this review.

We will first list all the programs we considered and then will provide a brief description of the type of phonemic awareness or phonics activities contained in each program. We will conclude with our recommendations of programs that are best for stimulating phonemic awareness. Only programs that included oral language activities (usually involving pictures) that did not require knowledge of letters are listed as training phonological awareness.

Section 4

Software Considered in This Review

Program Name	Publisher	Ages	PA Activities?
A to Zap	Sunburst	K to G2	No
Bailey's Book House	Edmark	6 to 8	Yes
Beginning Reading	Sierra	4 to 6	No
Curious George ABC Adventure	Houghton Mifflin Interactive	3 to 6	No
Curious George Young Readers Series	Houghton Mifflin Interactive	2 to 5	Yes
Darby the Dragon	Broderbund	5 to 8	No
Elmo's Preschool Deluxe	Creative Wonders	3 to 5	No
First Phonics	Sunburst	K to G2	No
Fisher-Price A-B-C's	Davidson	3 to 5	No
Franklin's Reading World	Sanctuary Woods	4 to 7	No
Get Set for Kindergarten	Creative Wonders	4 to 6	Yes
Green Eggs and Ham	Broderbund	3 to 7	Yes
Gregory and the Hot Air Balloon	School Zone	4 to 7	No
Interactive Learning Center—Kindergarten	School Zone	4 to 6	No
Interactive Learning Center—Phonics	School Zone	6 to 8	No
Interactive Learning Center—Preschool	School Zone	3 to 5	No
Interactive Phonics Workbook	School Zone	6 to 8	No
Interactive Preschool Workbook	School Zone	3 to 5	No
Jump Start First Grade	Knowledge Adventures	5 to 7	No
Jump Start Kindergarten	Knowledge Adventures	4 to 6	Yes
Jump Start Pre-K	Knowledge Adventures	3 to 5	No
Jump Start Preschool	Knowledge Adventures	2 to 5	No
Jump Start Toddlers	Knowledge Adventures	18m to 3y	No
Kid Phonics	Davidson	4 to 7	No
Let's Make a Word	Creative Wonders	4 to 6	Yes
Letters	Creative Wonders	3 to 5	??
The Little Engine	Packard Bell Interactive	4 to 7	No
The Little Samurai	Davidson	3 to 9	No
Reading Blaster	Davidson	7 to 10	??
Reading Blaster Junior	Davidson	4 to 7	Yes
Reading Who? Reading You!	Sunburst	K to G2	No
Ready to Read with Pooh	Disney Interactive	3 to 6	Yes
Richard Scarry's Best Reading Program Ever	Macromedia	3 to 6	Yes
Toddlers Deluxe	Creative Wonders	2 to 4	Yes

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Phonemic Awareness Activities in Software Programs

Bailey's Bookhouse
Choosing rhyming words, choosing words beginning with same sound, choosing words to complete a rhyme

Curious George Young Readers Series
Choosing a word to complete a rhyme

Get Set for Kindergarten
Choosing words that rhyme with one another

Green Eggs and Ham
Choosing a word to complete a rhyme

Jump Start Kindergarten
Child can click on a letter, hear the sound of the letter, hear a word that starts with the sound, and see a picture of the word; matching game to find words that rhyme with one another

Let's Make a Word
Choosing words that rhyme

Reading Blaster Junior
Choosing objects beginning with a given sound; matching words that rhyme

Ready to Read with Pooh
Choosing words to complete a rhyme

Richard Scarry's Best Reading Program Ever
Indicating if two words rhyme; finding words that end with the same sound as another word; matching words on the basis of their first sounds; telling whether two words begin with the same sound

Toddlers Deluxe
Finding words that begin with a given sound; selecting words to complete a rhyme

Most Highly Recommended Software Programs

Bailey's Bookhouse
This is an excellent program that not only contains activities that will stimulate phonological awareness, but also others that teach about letters and their sounds and story construction. The guide that accompanies the program provides examples of home exercises the child and parent can participate in together. The directions for the program are clear and easy to follow.

Green Eggs and Ham
The is actually a book on CD that includes several different activities to build phonological awareness and beginning skills with letters. It not only provides extensive experience with rhyme, but also gives children the opportunity to hear how new words can be made by changing the first letter

Ready to Read with Pooh
This is a very entertaining program that is also very easy to use. In addition to giving rich experience with rhyme, the program includes many activities to teach beginning letter/sound knowledge.

Richard Scarry's Best Reading Program Ever
This program contains the richest variety of activities to stimulate phonological awareness, and it also provides extensive practice on these activities. It also contains many activities designed to teach letter sounds and to communicate the idea that letters stand for the sounds in words.

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